

**aprilia**

**1074 2**

11/2002-00

**ATLANTIC 500**

www.serviceaprilia.com

**workshop**manual



8140633

# LIST OF SECTIONS

## Introduction

This manual contains information on how to perform the usual vehicle service procedures. This manual does not describe all of the procedures necessary to repair and service the vehicle in detail.

This publication is intended for use by **aprilia** dealers and their trained, experienced mechanics.

The descriptions of many service and repair operations have been intentionally omitted, as it is assumed that the users of this manual have basic mechanical training and basic knowledge of the procedures used for motor vehicle repair, as well as safety rules necessary to ensure their safety and that of the public while repairing motor vehicles.

Therefore, it is imperative that you do not attempt to perform any maintenance or repair procedure with which you are not thoroughly familiar, and fully qualified to perform. Such an attempt can result in defective repairs, which can be dangerous both to you, to the owner or user of the vehicle, and to the public in general.

The information and illustrations in this manual are current as of the manual's date of issue.

Since **aprilia s.p.a.** continually improves its products, there may be some differences between the vehicle you are servicing and the illustrations and instructions given in this manual. If you have any questions regarding the applicability of any service procedure given in this manual, contact **aprilia** consumer services (A.C.S.). A.C.S. Technical Counselors, will be able to assist you with any problems you might face as well as providing you with information on any updates and technical changes to the vehicle you are servicing.

For further information refer to:

SPARE PARTS CATALOGUE 6801;

ENGINE WORKSHOP MANUAL

8140603	(1063 1) - I
8140604	(1064 1) - E
8140605	(1065 1) - F
8140606	(1066 1) - D
8140607	(1067 1) - UK
8140608	(1068 1) - USA

Any change made to technical specifications and vehicle servicing procedures will be documented and distributed to **aprilia** dealers all over the world. These changes will be incorporated in later editions of this manual.

**aprilia s.p.a.** reserves the right to modify specifications and characteristics of any of its models at any time.

**aprilia** makes no representation that this manual covers any such changes.

First edition: september 2002

Produced and printed by:

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General information

1

## SAFETY WARNINGS

The following precautionary warnings are used throughout this manual in order to convey the following messages:

 **Safety warning.** When you find this symbol on the vehicle or in the manual, be careful to the potential risk of personal injury. Non-compliance with the indications given in the messages preceded by this symbol may result in grave risks for your and other people's safety and for the vehicle!

### WARNING

Indicates a potential hazard which may result in serious injury or even death.

### CAUTION

Indicates a potential hazard which may result in personal injury or damage to the vehicle or other property.

**NOTE** The word "NOTE" in this manual precedes important information or instructions.

## PRECAUTIONS AND GENERAL INFORMATION

Keep strictly to the following instructions when repairing, disassembling or reassembling the motorcycle.

### WARNING

Never use a naked flame for any operation whatsoever.

Before starting any servicing or inspection job on the motorcycle, stop the engine, remove the key, wait until the engine and exhaust have cooled down and, if possible, raise up the motorcycle, using the correct equipment standing on a solid, level floor. Be especially careful about the parts of the engine and exhaust that are still hot, to avoid burns.

Motorcycle parts are not edible; do not bite, suck, chew or swallow any of the motorcycle parts for any reason whatsoever.

Unless expressly stated otherwise, follow the disassembly steps in reverse order when reassembling units.

The overlapping of operations in references to other chapters must be interpreted in a logical way, to avoid the unnecessary removal of components.

Never use the fuel as a solvent to clean the motorcycle.

Disconnect the battery negative lead (-) control unit and spark plug, if electric welding has to be performed.

Always be careful about the safety of the others when two or more people are working at the same time.

### BEFORE DISASSEMBLY

Remove all dirt, mud, dust and foreign bodies from the motorcycle before removing any components. When specified, use the service tools specially designed for this motorcycle.

### DISASSEMBLY OF COMPONENTS

Never loosen and/or tighten nuts and bolts with pliers or other similar tools; always use a proper wrench.

Mark the positions of all unions and connections (hoses, wires, etc.) before disconnecting them with clearly distinguishable marks.

Each component must be clearly marked so that it can be identified for refitting.

Clean and wash each removed component with fire-proof solvent.

Paired components must be kept together, as they become "matched" after normal wear. Some paired components must either be used together or both replaced.

## REFITTING COMPONENTS

### ⚠ CAUTION

**Never use a circlip twice. When a circlip is removed, it must be replaced with a new one.**  
**When assembling a new circlip, be careful not to stretch its ends more than strictly necessary to place it on the shaft.**

**After installing a circlip, make sure that it is completely and firmly inserted in its seat.**

**Do not use compressed air to clean bearings.**

**NOTE** Bearings must turn freely with no sticking and/or noise. Replace bearings that show any roughness when the inner race is turned.

Use only Original **aprilia** Spare Parts for replacement.

Use only the recommended lubricants and sealing agents.

Lubricate all metal parts (where possible) before refitting them.

When tightening nuts and bolts, start with the larger diameter or inner ones and proceed in diagonal order.

Tighten them in gradual steps before applying the final tightening torque.

Always replace all self-locking nuts, gaskets, circlips, snap rings, O-rings, split pins and screws, if there is any sign of thread damage.

Thoroughly clean all mating surfaces, oil seal rims and gaskets before reassembly.

Apply a thin film of lithium-based grease to oil seal rims.

Refit the oil seal and bearings with the identification mark or serial number facing outwards (visible).

Lubricate bearings thoroughly when fitting.

Check to make sure that each component has been fitted properly.

After carrying out repairs or routine servicing, go through the pre-ride checklist thoroughly before riding the motorcycle or allowing it to be ridden. Take a trial run in a parking lot or other low traffic area before returning the motorcycle to its owner.

## USING THE MANUAL

### HOW TO CONSULT THE MANUAL

This manual is divided into chapters. Each chapter is based on a category of main components.

Refer to the "MAIN CONTENTS" list.

Unless expressly stated otherwise, follow the disassembly steps in reverse order when reassembling units.

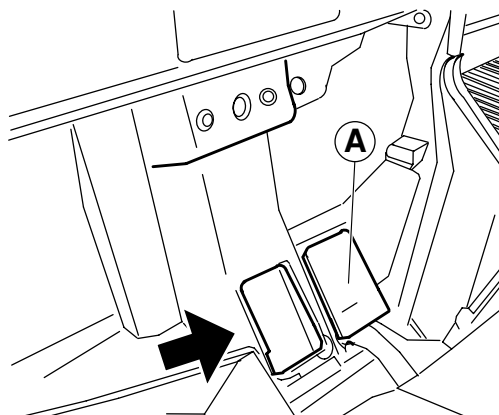
The terms "right" and "left" are intended as the rider's right and left when sitting in the normal riding position.

Consult the "USE AND MAINTENANCE" handbook for information on the normal use and servicing of the motorcycle.

## POSITION OF SERIAL NUMBERS

These numbers are required for vehicle registration.

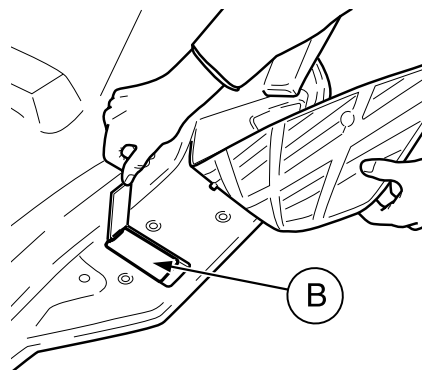
**NOTE** The alteration of the identification numbers is an offence, punishable with criminal and administrative sanctions. In particular, the alteration of the frame number will result in the immediate invalidation of the warranty.



## VEHICLE IDENTIFICATION NUMBER (V.I.N.) (FRAME NUMBER)

Every vehicle produced by **aprilia** receives a vehicle identification number (V. I. N.) stamped:

- on the steering head of the frame (A), as shown above;
- and also:
- on the identification plate (B) which is located on the front portion near the steering head of the frame.

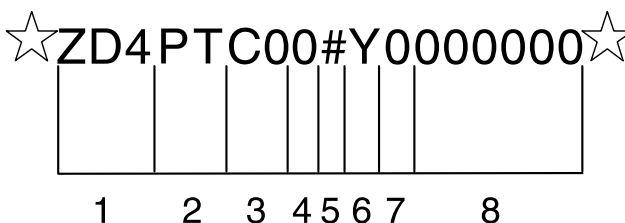
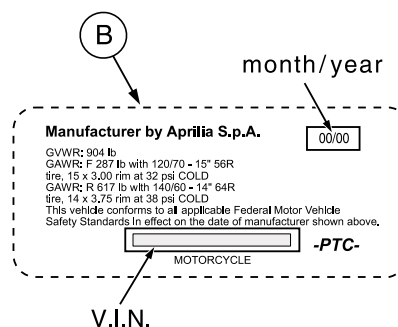


## INFORMATION CONTAINED IN THE VEHICLE IDENTIFICATION NUMBER

Description of the vehicle identification number (V. I. N.), stamped on the steering head of the frame (A) and on the identification plate (B), under the right carpet.

### DIGIT MEANING

- 1) Manufacturer's identification alphanumeric code.
- 2) Vehicle type.
- 3) Model.
- 4) Country for which the vehicle is intended.
- 5) # = Check digit number.
- 6) Model year.
- 7) Assembling factory designation  
(N = NOALE- VE-,  
S = SCORZÉ -VE-,  
O = NOT SPECIFIED).
- 8) Sequential serial number.

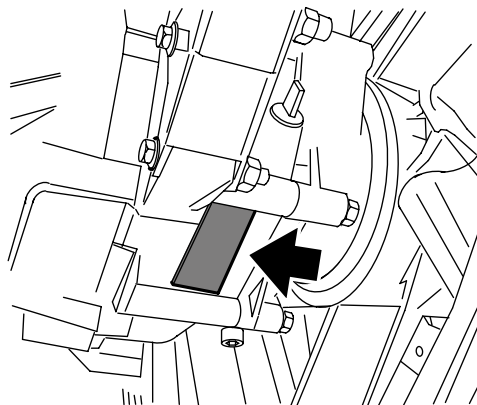




**ENGINE NUMBER**

The engine number is stamped near the lower rear shock absorber support.

Engine n° \_\_\_\_\_

**SAFETY WARNINGS FOR FUEL, LUBRICANTS COOLANT AND OTHER COMPONENTS****FUEL****▲ WARNING**

The fuel used for the propulsion of combustion engines is extremely inflammable and can become explosive under certain conditions.

Refueling and servicing operations should be carried out in well-ventilated areas with the engine switched off.

Do not smoke when refueling or in the vicinity of fuel vapors. All contact with naked flames, sparks or any other possible source of ignition or explosion must be absolutely avoided.

Do not allow fuel to spill out when filling the tank, as it could ignite on contact with the hot surfaces of the engine.

If fuel is accidentally spilt, check that the zone is perfectly dry before starting the motorcycle.

Fuel expands with heat and under direct sunlight.

For this reason, never fill the fuel tank right up to the brim.

Close the filler cap properly after refueling.

Do not allow fuel to come into contact with the skin. Do not swallow fuel or inhale the vapors. Do not transfer fuel from one container to another with a tube.

**DO NOT DISPOSE OF FUEL IN DRAINS, WATER COURSES OR THE SOIL.**

**KEEP OUT OF REACH OF CHILDREN.**

Use only leaded (4-star ) or unleaded petrol with minimum octane rating 95 (N.O.R.M.) and 85 (N.O.M.M.)

**ENGINE OIL****▲ WARNING**

Engine oil can cause serious skin damage if handled on a daily basis over a long period of time.

You are advised to wash your hands thoroughly after handling the oil.

Do not dispose of the oil in drains, watercourses or the soil.

Take the oil to (or have it collected by) the nearest used oil disposal agency or the supplier.

You are advised to wear rubber gloves when carrying out maintenance work.

Check the engine oil after the first 625 miles (1000 km) and then every 1,875 miles (3000 km). Change the engine oil every 3,750 mi (6000 km), see CHANGING THE ENGINE OIL AND THE ENGINE OIL FILTER.

**TRANSMISSION OIL****▲ WARNING**

Transmission oil can cause serious skin damage if handled on a daily basis over a long period of time. You are advised to wash your hands thoroughly after handling the oil.

Do not dispose of the oil in drains, watercourses or the soil.

Take the oil to (or have it collected by) the nearest used oil disposal agency or the supplier.

You are advised to wear rubber gloves when carrying out maintenance work.

Change the transmission oil after the first 625 miles (1000 Km) and then every 15,000 miles (24000 km) (see engine workshop manual).

**BRAKE FLUID****▲ WARNING**

Brake fluid can cause irritation if it comes into contact with the skin or eyes.

Thoroughly wash any parts of the body that come into contact with the fluid and contact an eye specialist or doctor if the fluid comes into contact with the eyes.

**DO NOT DISPOSE OF THE FLUID IN DRAINS, WATER COURSES OR THE SOIL.**

**KEEP OUT OF REACH OF CHILDREN.**

Avoid splashing brake fluid on the plastic or painted parts of the motorcycle, as it will cause damage.

Check the brake fluid level every 3,750 miles (6000 km), (CHECKING AND TOPPING UP THE FRONT BRAKE FLUID); change the fluid every two years, (CHANGING THE FRONT BRAKE FLUID).

**▲ CAUTION**

Do not use fluids other than those specified and do not top up with different fluids, as this will damage the braking system.

Do not use fluids that have been stored in old containers or that have been open for a long time.

Sudden variations in the play or looseness of the brake levers are caused by problems in the hydraulic circuits.

Check very carefully to ensure that there is no oil or grease on the brake discs and friction gaskets, especially after servicing or inspections.

Check that the brake hoses are not twisted or worn.

Make sure no water or dust gets into the circuit accidentally.

You are advised to wear rubber gloves when working on the hydraulic circuit.

**FORK OIL****▲ WARNING**

Fork oil can cause serious skin damage if handled on a daily basis over a long period of time.

You are advised to wash your hands thoroughly after handling the oil.

Do not dispose of the oil in drains, water courses or the soil.

Take the oil to (or have it collected by) the nearest used oil disposal agency or the supplier.

You are advised to wear rubber gloves when carrying out maintenance work.

Altering the setting of the dampers and/or the viscosity of the oil in them could partially change the responsiveness of the suspension.

The viscosity grades can be chosen on the basis of the kind of ride wanted for the motorcycle.

## COOLANT

**▲ WARNING**

Coolant is harmful if swallowed; it may cause irritation if it comes into contact with the eyes or skin. Rinse for a long time with water and call a doctor if coolant comes into contact with the skin or eyes. If swallowed, induce vomiting, rinse the mouth and throat with lots of water and call a doctor immediately.

**DO NOT DISPOSE OF THE FLUID IN DRAINS, WATER COURSES OR THE SOIL.**

**KEEP OUT OF REACH OF CHILDREN.**

**▲ WARNING**

Be careful not to spill coolant on the hot parts of the engine; it may catch fire and burn with invisible flames.

You are advised to wear rubber gloves when carrying out maintenance work.

**Do not use the motorcycle if the coolant is below the minimum level.**

Check the coolant level before starting and every 1,250 miles (2000 km), (CHECKING AND TOPPING UP THE COOLANT); change the coolant every two years, (CHANGING THE COOLANT).

The coolant solution is made up of 50% water and 50% antifreeze. This is the ideal mixture for most running temperatures and ensures good protection against corrosion.

You are advised to keep the same mixture in the warmer season as well, to reduce loss by evaporation and avoid frequent topping-up.

This will also reduce the quantity of mineral salt deposits left in the radiator when the water evaporates and ensure that the cooling system keeps working at the same level of efficiency.

If the external temperature falls to below zero degrees centigrade, check the coolant circuit frequently, adding a higher concentration of antifreeze if necessary (up to a maximum of 60%).

Use only distilled water in the solution, to avoid damaging the engine.

**NOTE** Different antifreeze fluids have different characteristics. The guaranteed grade of protection is given on the label on the product container.

**▲ CAUTION**

**Use only antifreeze and anti-corrosion fluids without nitrite, as these guarantee protection to -35°C (-31°F).**

## CARBON MONOXIDE

If a servicing operation has to be carried out with the engine running, make sure this is done in the open air or in a well-ventilated area.

Never run the engine in enclosed spaces.

If you have to work in an enclosed space, use an exhaust fume extraction system.

### ▲ WARNING

**Exhaust fumes contain carbon monoxide, a poisonous gas that can cause loss of consciousness and death.**

Run the engine in the open air or, if you have to work in an enclosed space, use an exhaust fume extraction system.

## COMPONENTS AT HIGH TEMPERATURES

### ▲ WARNING

**The engine and the exhaust system components get very hot and stay hot for a certain time after the engine has been switched off.**

**Wear heat-proof gloves if you have to handle these components, or else wait until the engine and exhaust system have cooled down.**

## RUNNING-IN RULES

### ▲ WARNING

**After the motorcycle has been operated for 625 miles (1000 km), perform the checking operation shown in the column "After running-in" of the REGULAR SERVICE INTERVALS CHART.**

The internal parts of the engine and transmission must be properly run-in to ensure their long life and dependable operation. If possible, while breaking in your motorcycle, ride on hilly roads and/or roads with many curves so that the engine and transmission undergo lots of speed changes.

**NOTE** The best vehicle speeds and acceleration will only be obtained after the first 625 miles (1000 km) of running-in.

Follow these instructions carefully:

- Do not turn the accelerator handlebar fully at low speeds, either during or after running-in.
- **0-62 mi (0-100 km)**  
During the first 62 miles (100 km) use the brakes with care, avoiding any sudden or prolonged braking actions. This will allow the correct bedding of friction material from the pads on the brake disc.
- **0-312 mi (0-500 km)**  
For the first 312 miles (500 km), do not ride the vehicle at more than 80% of its foreseen maximum speed.
- Avoid keeping a constant speed on long sections of road.
- After the first 625 miles (1000 km), progressively increase speed until you reach maximum performance levels.

## PRECAUTIONS AND GENERAL INFORMATION

Keep strictly to the following instructions when repairing, disassembling or reassembling the motorcycle.

### ⚠ WARNING

**Never use a naked flame for any operation whatsoever.**

**Before starting any servicing or inspection job on the motorcycle, stop the engine, remove the key, wait until the engine and exhaust have cooled down and, if possible, raise up the motorcycle, using the correct equipment standing on a solid, level floor. Be especially careful about the parts of the engine and exhaust that are still hot, to avoid burns.**

**Motorcycle parts are not edible; do not bite, suck, chew or swallow any of the motorcycle parts for any reason whatsoever.**

**Unless expressly stated otherwise, follow the disassembly steps in reverse order when reassembling units.**

**Do not run the engine in closed or badly ventilated rooms.**

**Handle gasoline, which is extremely flammable and highly explosive, with the utmost care.**

**Never use the fuel as a solvent to clean the motorcycle.**

**Always be careful about the safety of the others when two or more people are working at the same time.**

- Only use genuine **aprilia** SPARE PARTS.
- Only use the recommended lubricants.
- Use, when necessary, the special tools designed for this vehicle.
- When tightening screws, nuts and bolts, start with the largest diameter or innermost fasteners, and tighten diagonally across their layout.
- Carefully clean all disassembled parts with a nonflammable detergent.
- Lubricate the parts (naturally, where possible) before refitting.
- Make sure that all parts have been refitted correctly.
- Always replace gaskets, grommets, circlips, O-rings and split pins with new ones.
- Mark the positions of all connection joints (pipes, cables, etc.) before disconnecting them, using a different distinguishing mark.  
Each piece must be clearly marked for easy identification during installation.

### ⚠ CAUTION

**Never use a circlip twice.**

**When a circlip is removed from a shaft, it must be replaced with a new one.**

**When fitting a new circlip, take care not to stretch its ends any more than is strictly necessary to fit it to the shaft.**

**After installing a circlip, make sure that it is completely and firmly inserted in its seat.**

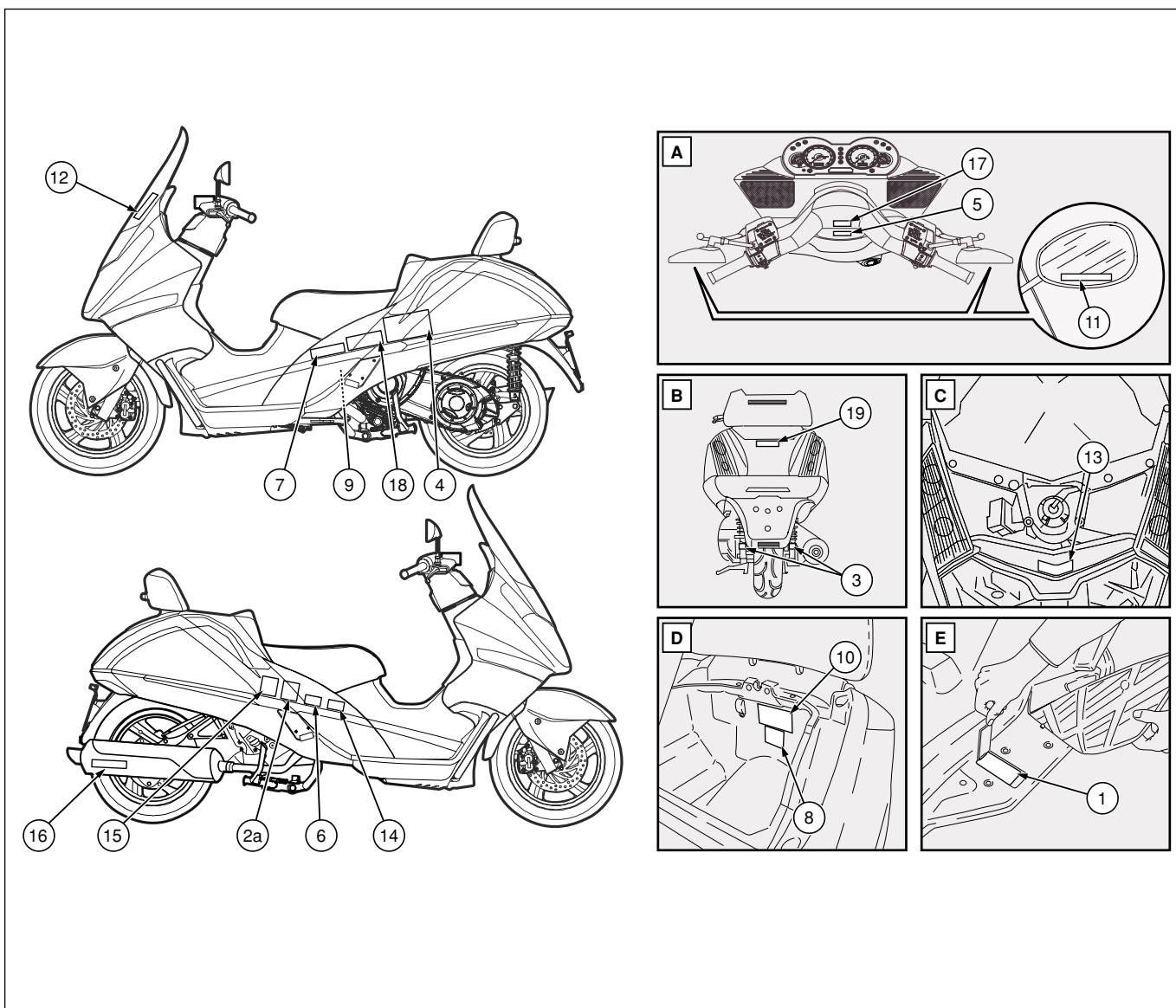
## SPARE PARTS

Only use original **aprilia** Spare Parts. Original **aprilia** Spare Parts are high quality and have been designed and built especially for **aprilia** vehicles.

### ⚠ CAUTION

**The use of anything other than genuine **aprilia** spare parts may cause performance problems and damage to the vehicle.**

## POSITION OF THE WARNING ADHESIVE LABELS

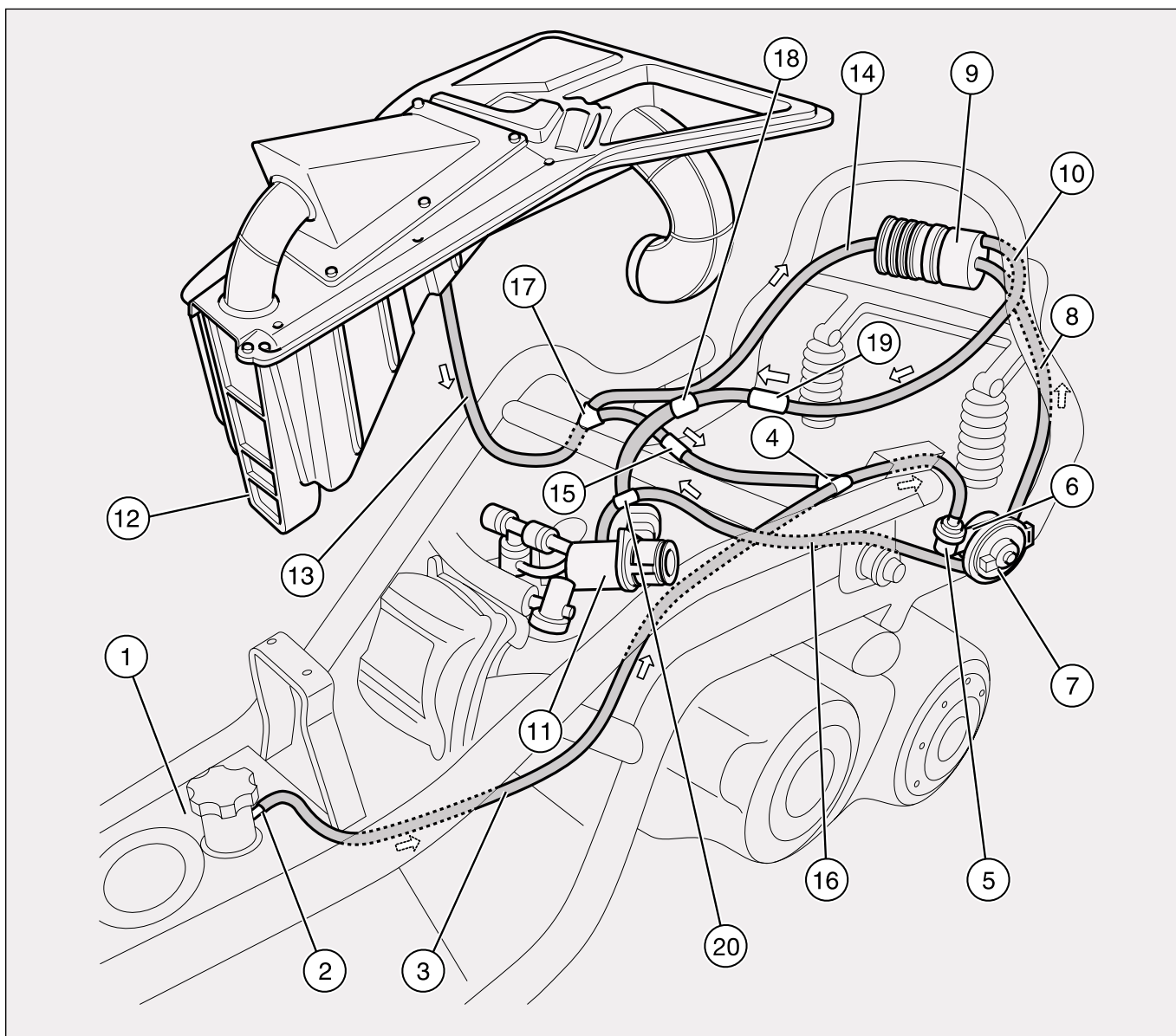


## WARNING ADHESIVE LABELS CHART

Ref.	Description	Ref.	Description
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S.p.A.</div><div><div><div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></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## CALIFORNIA EVAPORATIVE EMISSION SYSTEM



FOR STATE OF CALIFORNIA ONLY.

- 1) Fuel tank
- 2) Tank fumes relief
- 3) Tank fumes breather tube
- 4) Tee
- 5) Roll over valve
- 6) Roll over valve - purge valve connection tube
- 7) Purge valve
- 8) Purge valve - carbon canister connection tube
- 9) Carbon canister
- 10) Intake coupling hose
- 11) Throttle
- 12) Air box
- 13) Warm air inlet (from air box)
- 14) Carbon canister washing hose
- 15) One way valve
- 16) Purge valve - throttle connection tube
- 17) Tee
- 18) Narrow passage
- 19) Security valve
- 20) Tee

## **aprilia s.p.a. EMISSION CONTROL SYSTEM WARRANTY STATEMENT**

### **YOUR WARRANTY RIGHTS AND OBLIGATIONS**

The California Air Resources Board and **aprilia s.p.a.** (hereinafter **aprilia**) are pleased to explain the emission control system warranty on your 1999 and later motorcycle. In California new motor vehicles must be designed, built and equipped to meet the State's stringent anti-smog standards.

**aprilia** must warrant the emission control system on your vehicle for the periods of time listed below provided there has been no abuse, neglect or improper maintenance of your motorcycle.

Your emission control system may include parts such as the carburetor or fuel-injection system, the ignition system, catalytic converter and engine computer. Also included may be hoses, belts, connectors and other emission-related assemblies.

Where a warrantable condition exists, **aprilia** will repair your motorcycle at no cost to you, including diagnosis, parts and labor.

### **MANUFACTURER'S EMISSIONS WARRANTY COVERAGE**

Class I motorcycles (50-169 cm<sup>3</sup>): for a period of use of five (5) years or 7,456 miles (12,000 km), whichever first occurs.

Class II motorcycles (170 to 279 cm<sup>3</sup>): for a period of use of five (5) years or 11,185 miles (18,000 km), whichever first occurs.

Class III motorcycles (280 cm<sup>3</sup> and larger): for a period of use of five (5) years or 18,641 miles (30,000 km), whichever first occurs.

If an emission-related part on your motorcycle is defective, the part will be repaired or replaced by **aprilia**. This is your emission control system DEFECTS WARRANTY.

### **OWNER'S WARRANTY RESPONSIBILITIES**

- As the motorcycle owner, you are responsible for the performance of the required maintenance listed in your owner's manual.  
**aprilia** recommends that you retain all receipts covering maintenance on your motorcycle, but **aprilia** cannot deny warranty solely for the lack of receipts or for your failure to ensure the performance of all scheduled maintenance.
- You are responsible for presenting your motorcycles to an **aprilia** dealer as soon as a problem exists. The warranty repairs should be completed in a reasonable amount of time, not to exceed 30 days.
- As the vehicle owner, you should be aware that **aprilia** may deny your warranty coverage if your motorcycle or a part has failed due to abuse, neglect, improper maintenance or unapproved modifications.

If you have any questions regarding your warranty rights and responsibilities, you should contact **aprilia s.p.a.**, Via G. Galilei, 1, 30033 Noale (VE) Italy tel. +39 -041 58 29 111, fax +39 - 041 44 10 54, or the California Air Resources Board at P.O. Box 8001, 9528 Telstar Avenue, El Monte, CA 91734-8001.

**aprilia s.p.a. LIMITED WARRANTY ON EMISSION CONTROL SYSTEM**

**aprilia s.p.a.**, Via G. Galilei, 1, 30033 Noale (VE) Italy (hereinafter **aprilia**) warrants that each new 1999 and later **aprilia** motorcycle, that includes as standard equipment a headlight, taillight and stop-light, and is street legal:

- A. is designed, built and equipped so as to conform at the time of initial retail purchase with all applicable regulations of the United States Environmental Protection Agency, and the California Air Resources Board; and
- B. is free from defects in material and workmanship which cause such motorcycle to fail to conform with applicable regulations of the United States Environmental Protection Agency of the California Air Resources Board for a period of use, depending on the engine displacement, of 7,456 miles (12,000 km), if the motorcycle's engine displacement is less than 170 cubic centimeters; of 11,185 miles (18,000 km), if the motorcycle's engine displacement is equal to or greater than 170 cubic centimeters but less than 280 cubic centimeters; or of 18,641 miles (30,000 km), if the motorcycle's engine displacement is 280 cubic centimeters or greater; or 5 (five) years from the date of initial retail delivery, whichever first occurs.

**I. COVERAGE.** Warranty defects shall be remedied during customary business hours at any authorized **aprilia** motorcycle dealer located within the United States of America in compliance with the Clean Air Act and applicable regulations of the United States Environmental Protection Agency and the California Air Resources Board. Any part or parts replaced under this warranty shall become the property of **aprilia**.

In the State of California only, emission related warranted parts are specifically defined by the state's Emission Warranty Parts List. These warranted parts are:  
carburetor and internal parts; intake manifold; fuel tank; fuel injection system; spark advance mechanism; crank-case breather; air cutoff valves; fuel tank cap for evaporative emission controlled motorcycles; oil filter cap; pressure control valve; fuel/vapor separator; canister; igniters; breaker governors; ignition coils; ignition wires; ignition points; condensers, and spark plugs if failure occurs prior to the first scheduled replacement; and hoses, clamps, fittings and tubing used directly in these parts. Since emission related parts may vary from model to model, certain models may not contain all of these parts and certain models may contain functionally equivalent parts.

In the State of California only, Emission Control System emergency repairs, as provided for in the California Administrative Code, may be performed by other than an authorized **aprilia** dealer. An emergency situation occurs when an authorized **aprilia** dealer is not reasonably available, a part is not available within 30 days, or a repair is not complete within 30 days. Any replacement part can be used in an emergency repair. **aprilia** will reimburse the owner for the expenses, including diagnosis, not to exceed **aprilia**'s suggested retail price for all warranted parts replaced and labor charges based on **aprilia**'s recommended time allowance for the warranty repair and the geographically appropriate hourly labor rate. The owner may be required to keep receipts and failed parts in order to receive compensation.

**II. LIMITATIONS.** This Emission Control System warranty shall not cover any of the following:

- A. Repair or replacement required as a result of
- (1) accident,
  - (2) misuse,
  - (3) repairs improperly performed or replacements improperly installed,
  - (4) use of replacement parts or accessories not conforming to **aprilia** specifications which adversely affect performance and/or
  - (5) use in competitive racing or related events.
- B. Inspections, replacement of parts and other services and adjustments required for required maintenance.
- C. Any motorcycle on which the odometer mileage has been changed so that actual mileage cannot be readily determined.

### III. LIMITED LIABILITY

A. The liability of **aprilia** under this Emission

Control System Warranty is limited solely to the remectying of defects in material of workmanship by an authorized aprilia motorcycle dealer at its place of business during customary business hours. This warranty does not cover inconvenience or loss of use of the motorcycle or transportation of the motorcycle to or from the **aprilia** dealer.

**aprilia** SHALL NOT BE LIABLE FOR ANY OTHER EXPENSES, LOSS OR DAMAGE, WHETHER DIRECT, INCIDENTAL, CONSEQUENTIAL OR EXEMPLARY ARISING IN CONNECTION WITH THE SALE OR USE OF OR INABILITY TO USE THE aprilia MOTORCYCLE FOR ANY PURPOSE. SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATIONS MAY NOT APPLY TO YOU.

B. NO EXPRESS EMISSION CONTROL SYSTEM WARRANTY IS GIVEN BY **aprilia** EXCEPT AS SPECIFICALLY SET FORTH HEREIN. ANY EMISSION CONTROL SYSTEM WARRANTY, IMPLIED BY LAW, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, IS LIMITED TO THE EXPRESS EMISSION CONTROL SYSTEM WARRANTY TERMS STATED IN THIS WARRANTY, THE FOREGOING STATEMENTS OF WARRANTY ARE EXCLUSIVE AND IN LIEU OF ALL OTHER REMEDIES. SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS SO THE ABOVE LIMITATIONS MAY NOT APPLY TO YOU.

C. No dealer is authorized to modify this **aprilia** Limited Emission Control System Warranty.

IV. **LEGAL RIGHTS.** THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM STATE TO STATE.

V. THIS WARRANTY IS IN ADDITION TO THE **aprilia** LIMITED MOTORCYCLE WARRANTY.

VI. **ADDITIONAL INFORMATION.** Any replacement part that is equivalent in performance and durability may be used in the performance of any maintenance or repairs.

However, **aprilia** is not liable for these parts. The owner is responsible for the performance of all required maintenace.

Such maintenance may be performed at a service establishment or by any individual.

The warranty period begins on the date the motorcycle is delivered to an ultimate purchaser.

**aprilia s.p.a.**

Via G. Galilei, 1  
30033 Noale (VE) Italy

**aprilia USA, Inc.**

110 Londonderry Ct., Suite 130  
Woodstock, GA 30188

## TECHNICAL SPECIFICATIONS

DIMENSIONS	
Max. length	89.4 in (2270 mm)
Max. width	28.3 in (720 mm)
Max. height (al front fairing)	57.0 in (1450 mm)
Saddle height	30.7 in (780 mm)
Wheelbase	62.0 in (1575 mm)
Minimum ground clearance	5.9 in (150 mm)
Weight in operating condition	440.9 lbs (200 Kg)

ENGINE	
Type	Single- cylinder 4- stroke, 4 valves, single shaft with camshaft at the head, controlled by chain on the flywheel side
Number of valves	4
Number of cylinders	1
Total displacement	28.0 cu.in (460 cm <sup>3</sup> )
Bore / stroke	3.6 in / 2.7 in (92 mm / 69 mm)
Compression ratio	10.5 : 1
Starting	Electric
Engine rpm idling	1450 ± 50 rpm
Clutch	Automatic, dry centrifugal
Gearshift	Automatic
Lubrication	Forced circulation with trochoidal pump (in the crankcase), oil filter and pressure regulator by-pass
Cooling	Fluid with forced circulation by centrifugal pump


DRIVE	
Variator	Continuous automatic
Primary	Trapezoidal belt
Secondary	Gears
Total engine / wheel ratio	short 1/11.988 long 1/4.86

CAPACITY	
Fuel (including reserve)	4.48 gal (17 ℓ)
Fuel reserve	1.05 gal (4 ℓ)
Engine oil	
- engine oil and oil filter change	91.5 cu.in (1500 cm <sup>3</sup> )
- change due to engine overhaul	103.7 cu.in (1700 cm <sup>3</sup> )
Transmission oil	~ 15.25 cu.in (250 cm <sup>3</sup> )
Coolant (50% water + 50% antifreeze with ethylene glycol)	0.39 gal (1.5 ℓ)
Front fork oil	13.42 cu.in (220 cm <sup>3</sup> ) (for tube)
Seats	2
Vehicle max. load (rider + luggage)	231.4 lbs (105 Kg)
Vehicle max. load (rider + passenger + luggage)	396.8 lbs (180 Kg)

THROTTLE BODY	
Model	Ø 1.5 in (38 mm) and single injector
Choke	Diameter 1.53 in (39 mm)

CONTINUED &gt;

**FUEL SUPPLY**

Type	Electronic injection with electric fuel pump
Fuel	Unleaded gasoline (4 Stars  ) , with minimum octane rating of 95 (RON) and 85 (MON)

**FRAME**

Type	High-resistance steel tubes
Steering angle	28°, 50'
Trail	4.6 in (118 mm)

**SUSPENSIONS**

Front	Hydraulically operated telescopic adjustable fork
Stroke	3.93 in (100 mm) rear
Rear	Two dual-effect hydraulic shock absorbers with pre-load with five settings
Wheel stroke	3.93 in (100 mm)

**BRAKES**

Front	Disc - Ø 10.23 in (260 mm) - with hydraulic trasmission
Rear combined	Double disc - front 10.23 in (260 mm) rear 8.66 in (220 mm)

**WHEEL RIMS**

Type	light alloy
Front	15 x 3.00
Rear	14 x 3.75

**TYRES**

Type	Without inner tube (tubeless)
Front	120 / 70 - 15 M/C 56R
Rear	140 / 60 - 14 M/C REINF. 64R
STANDARD INFLATION PRESSURE	
Front	210 kPa (2.1 bar/30.4 psi)
Rear	230 kPa (2.3 bar/33.3 psi)
INFLATION PRESSURE WITH PASSENGER	
Front	220 kPa (2.2 bar/31.9 psi)
Rear	260 kPa (2.6 bar/37.7 psi)

**IGNITION**

Type	C.D.I. / inductive
Ignition advance	Variable advance managed by the injection control unit

**SPARK PLUG**

Standard	CHAMPION RG6YC
- Alternatively	NGK - CR7EKB
Spark plug gap	0.027 - 0.031 in (0.7 - 0.8 mm)



**ELECTRICAL SYSTEM**

Battery	12 V - 14 Ah
Fuses	30 - 20 - 15 - 3 A
Alternator (with permanent magnet)	14 V - 330 W

**BULBS**

Headlight / high beam	12 V - 55 W / 12 V - 35 W
Front parking light	12 V - 5 W
Rear / front direction indicators	rear 16 W - front 10 W
Rear parking / brake light	12 V - 5 / 21 W
Helmet compartment lighting	12 V - 3 W
License plate lamp	12 V - 5 W
Dashboard light	LED
Third brake lights	12 V - 2.3 W

**WARNING LIGHTS**

Direction indicators	LED
Engine oil pressure	LED
Low beam	LED
High beam	LED
Fuel reserve	LED
Brake pad wear	LED
High coolant temperature indicator	LED

**LUBRICANT CHART**

**Engine oil (recommended):** SUPERBIKE 4, SAE 5W - 40 or 4T FORMULA RACING, SAE 5W - 40.  
Alternatively to the oils recommended, you may use brand-name oils with performance levels that match or exceed A.P.I. SJ specifications.

**Transmission oil (recommended):** F.C., SAE 75W - 90 or GEAR SYNTH, SAE 75W - 90.  
Alternatively to the oils recommended, it is possible to use high-quality oils with performance characteristics equivalent or superior to A.P.I. GL3 specifications.

**Fork oil (recommended):** F. A. 5W or F. A. 20W; ; an alternative FORK 5W or FORK 20W.

If you need an oil with characteristics halfway between those offered by: F.A.5 W and F.A.20W or FORK 5W and FORK 20W, these can be mixed as indicated below:

SAE 10W = F. A. 5W 67% of the volume + F. A. 20W 33% of the volume, or  
 FORK 5W 67% of the volume + FORK 20W 33% of the volume.

SAE 15W = F. A. 5W 33% of the volume + F. A. 20W 67% of the volume, or  
 FORK 5W 33% of the volume + FORK 20W 67% of the volume.

**Bearings and other lubrication points (recommended):** BIMOL GREASE 481 - GREASE SM2.

As an alternative to the recommended product, use high-quality grease for rolling bearings, working temperature range -22°F... +284°F (-30°C... +140°C), dripping point 302°F... 446°F (150°C... 230°C), high protection against corrosion, good resistance to water and oxidation.

**Protection of battery poles:** Neutral grease or Vaseline.

**▲ WARNING**

**Use only fresh brake fluid.**

**Brake fluid (recommended):** F.F. DOT 5 (DOT 4 compatible) - BRAKE 5.1 DOT 5 (DOT 4 compatible).  
As an alternative to the fluid recommended, you may use high-quality fluids with performance levels that meet or exceed specifications for synthetic fluid SAE J1703, NHTSA 116 DOT 4, ISO 4925.

**▲ WARNING**

**Use only nitrite-free antifreeze and anticorrosive, that ensures protection at -35° C (-31°F) at least.**

**Engine coolant (recommended):** ECOBLU - 40° C - COOL.

As an alternative to the fluid recommended, you may use high-quality fluids with performance levels that meet or exceed specifications for monoethylene glycol based antifreeze fluid, CUNA NC 956-16.

## TIGHTENING TORQUE CHART

DESCRIPTION	ftlb	Nm
<b>FRAME ASSEMBLY</b>		
Passenger footrest fastening screw	14.75	20
Steering lock plate screws	8.68	12
Locking ring nut	36.88	50
Key commutator blind fastening screw	7.23	10
Threaded bushing	2.21	3
Key commutator fastening screw	7.23	10
<b>WINDSHIELD SUPPORT ASSEMBLY</b>		
Windshield support fastening screw	7.23	10
Windshield support fastening nut	7.23	10
<b>STEERING DAMPER ASSEMBLY</b>		
Damper to frame fastening screw	7.23	10
Nut	7.23	10
Damper fork side fastening screw	7.23	10
<b>FOOTREST ASSEMBLY</b>		
Footrest fastening screw	14.75	20
<b>ENGINE FORK ASSEMBLY</b>		
TCEI screw	59	80
Frame fork pin	44.25	60
Engine fork pin	44.25	60
<b>STAND ASSEMBLY</b>		
Stand screw	33.19	45
Low nut	22.12	30
Side stand screw	7.23	10
<b>FRONT SUSPENSION ASSEMBLY</b>		
Nut	11.06	15
Steering series self-locking nut	79.59	110
Flanged screw	18.44	25
<b>REAR SUSPENSION ASSEMBLY</b>		
Screw	36.88	50
Screw	18.44	25
<b>FRONT BRAKE ASSEMBLY</b>		
TCEI screw	19.91	27
<b>REAR BRAKE ASSEMBLY</b>		
TCEI screw	19.91	27
<b>HANDLEBAR-CONTROL ASSEMBLY</b>		
Screw	29.50	40
Left and right light dimmers	1.47	2
U bolt fastening screws	7.23	10
Hex-head screw	7.23	10
Anti-vibration weight fastening screws	7.23	10
<b>ENGINE ASSEMBLY</b>		
Damper support fastening screw	18.44	25
<b>EXHAUST ASSEMBLY</b>		
Plate-engine fastening screw	36.88	50
Exhaust fastening screw	36.88	50
Manifold clamp	7.23	10
Serpress nut	18.44	25
Heat guard protection fastening screws	5.90	8

DESCRIPTION	ftlb	Nm
<b>FRONT WHEEL ASSEMBLY</b>		
Wheel pin	36.88	50
Speedometer sensor screw	6.63	9
Hub screw	7.23	10
<b>REAR WHEEL ASSEMBLY</b>		
Nut	110.64	150
<b>PASSENGER HANDLE SUPPORTS ASSEMBLY</b>		
Passenger handle supports fastening TBEI screw	14.75	20
<b>PASSENGER BACKREST SUPPORT ASSEMBLY</b>		
Backrest support assembly fastening screw	7.23	10
<b>LIGHT BOW BOTTOM SUPPORT ASSEMBLY</b>		
Backrest support fastening screw	7.23	10
<b>WINDSHIELD SUPPORT ASSEMBLY</b>		
Windshield support fastening self-locking nut	7.23	10
<b>PASSENGER HANDLES ASSEMBLY</b>		
Passenger handles fastening TCEI screw	18.44	25
<b>BUMPER PIPES ASSEMBLY</b>		
Stainless steel flanged TBEI screw	7.23	10
<b>ELECTRICAL COMPONENTS ASSEMBLY</b>		
Coil fastening screw	1.47	2
Nut	1.47	2
Rotary switch screw	7.23	10
Rotary switch screw	7.23	10
Relay cable fastener	3.68	5
Reflector nut	1.10	1.5
Fuel pump flange self-locking M5 nut	2.21	3
<b>COOLING SYSTEM ASSEMBLY</b>		
Sleeve clamps	2.21	3
<b>FILTER CASING ASSEMBLY</b>		
Sleeve fasteners	2.21	3
<b>SADDLE ASSEMBLY</b>		
Saddle hinge nut	5.90	8
<b>FUEL TANK ASSEMBLY</b>		
Nut	5.16	7



**Routine maintenance  
operations**

**2**

This section describes the routine maintenance procedures for the main components of the motorcycle.

**▲ WARNING**

Before starting any maintenance or inspection job on the motorcycle, stop the engine and remove the key, and wait until the engine and exhaust system have cooled down. Place the motorcycle on a workstand, which is solidly attached to the floor. Raise the motorcycle up to the point where it may conveniently be worked on.

Use extreme caution when working around parts of the engine and exhaust which may remain hot for a long time.

**NOTE** Unless expressly stated otherwise, reassemble the motorcycle in the reverse order from the disassembly steps given in this manual.



## ROUTINE MAINTENANCE PLAN

In order to keep the motorcycle in excellent working order, **aprilia** urges you to keep to the specified intervals when servicing the various components.

## SCHEDULED MAINTENANCE CHART

### OPERATIONS HANDLED BY THE **aprilia** dealer

COMPONENTS	End of breaking-in 625 mi (1,000 km)	Every 3,750 mi (6,000 km) or 8 months	Every 7,500 mi (12,000 km) or 16 months
Throttle cable (adjusting)	①	①	
Variator belt			③
Steering bearings and steering	①	①	
Wheel bearings		①	
Engine oil filter		every 3,750 mi (6,000 km): ③	
Valve clearance		④	every 11,250 mi (18,000 km)
Brake system	①	①	
Cooling system	①	①	
Brake light switches		①	
Brake fluid	every 3,750 mi (6,000 km): ① / every 2 years: ③		
Coolant	every 1,250 mi (2,000 km): ① / every 2 years: ③		
Engine oil	①	every 1,875 mi (3,000 km):①/every 3,750 mi (6,000 km):③	
Fork oil	every 18,750 mi (30,000 km) or 4 years: ③		
Transmission oil	③	①	every 15,000 mi (24,000 km):③
Variator rollers and plastic variator guides			①
Wheels/tires and inflation pressure			①
Tighten nuts and bolts	①	①	
Bleed brake fluid	①		
Fuel lines	①	①	every 4 years: ③
Fuel filter		every 15,000 mi (24,000 km):①	every 30,000 mi (48,000 km):③
Battery-Electrolyte level	①	①	
Spark plug		①	③
Air filter		②	every 11,250 mi(18,000 km):③
Throttle operation	①	①	
Antilock brakes operation	①	①	
Light system	①	①	
Light positioning - operation		①	
Suspensions	①	①	
Engine oil pressure LED	at every start-up: ① (*)		
Front and rear brake pad wear	①	every 1,250 mi (2,000 km): ①	
CO setting	①	①	
Shed system	①	①	

(\*) To check see page TABLE OF INSTRUMENTS AND INDICATORS.

① = check and clean, adjust, lubricate or replace if necessary; ② = clean; ③ = replace; ④ = adjust.

**Perform maintenance operations more frequently if the vehicle is used in rainy or dusty areas or on bumpy/rocky roads.**



## LUBRICATION POINTS

Regular lubrication, using the correct lubricants, is an important factor in ensuring the long life and excellent performance of the motorcycle.

**NOTE** Before lubricating, completely clean the oxidation from all parts and remove all grease, dirt and dust.

Any exposed parts subject to rusting, must be lubricated with engine oil or grease (see LUBRICANT CHART).

The “LUBRICATION DIAGRAM” shows the lubrication points.

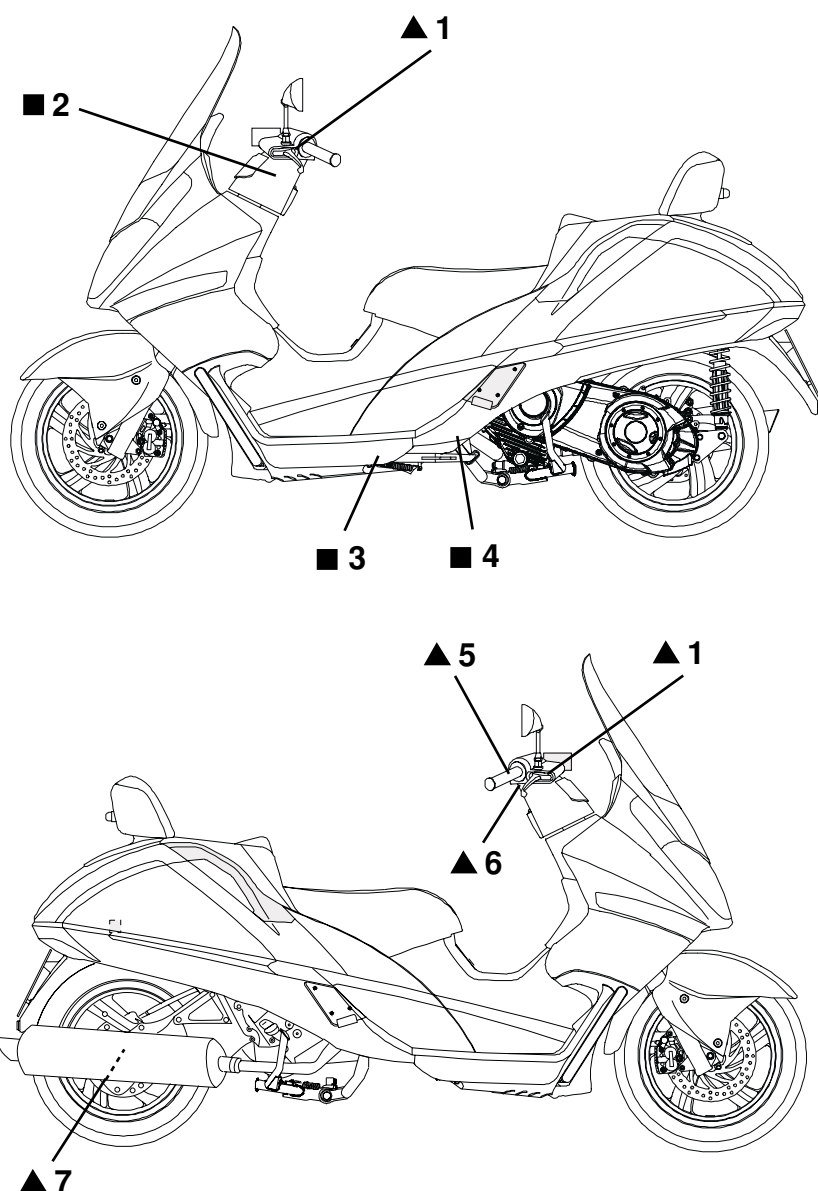
## LUBRICATION DIAGRAM

### KEY TO LUBRICATION DIAGRAM

- 1) Brake lever pivot
- 2) Steering bearings
- 3) Side stand pivot
- 4) Center stand pivot
- 5) Throttle control
- 6) Throttle cable
- 9) Rear wheel spindle

■ = Grease

▲ = Oil



## BATTERY

### Carefully read (MAINTENANCE).

After the first 625 mi (1,000 km) and every 3,750 mi (6,000 km) thereafter, check the electrolyte level and make sure the terminals are firmly tightened.

#### ▲ WARNING

##### **Danger of fire.**

Fuel and other flammable substances must be kept away from electrical components.

Battery electrolyte is toxic, caustic and may burn in contact with the skin, since it contains sulfuric acid. Wear protective clothing, a face mask and/or safety goggles when performing maintenance.

If any electrolyte fluid comes into contact with the skin, rinse thoroughly with cool running water.

Should it accidentally contact your eyes, flush immediately with running water for fifteen minutes, then immediately seek professional medical attention.

Should you accidentally swallow battery electrolyte, drink large amounts of milk or water, then continue with milk of magnesia or vegetable oil. See a physician immediately.

Since the battery gives off explosive hydrogen gas, keep away from open flames, sparks or cigarettes, or any other source of heat.


Make sure the area is adequately ventilated during recharging or while running the engine; avoid inhaling the fumes emitted while recharging the battery.

#### **KEEP OUT OF REACH OF CHILDREN.**

Be careful not to tilt the vehicle too far, to avoid hazardous battery fluid leaks.

#### ▲ CAUTION

Never reverse the battery cable connections.

Connect and disconnect the battery with the ignition switch set to “” to avoid damaging certain components.

Connect first the positive cable (+), then the negative (-).

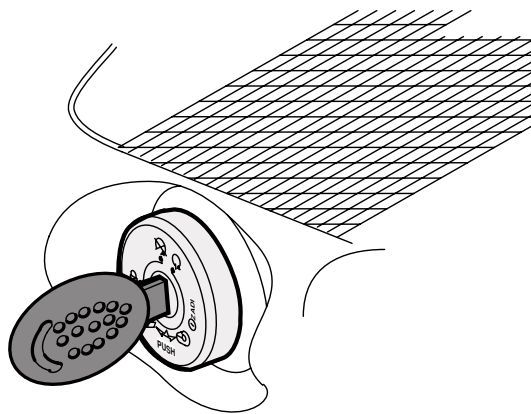
Disconnect in reverse order.

The battery fluid is corrosive.

Do not spill or spatter it, especially on plastic parts.

If you are installing a “MAINTENANCE-FREE” battery, recharge using a specifically designed battery charger (with constant voltage/amperage or constant voltage).

Using a conventional battery charger could damage the battery.

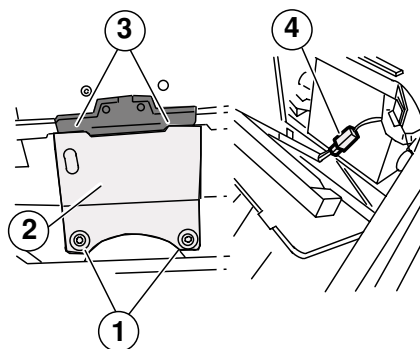


## REMOVAL BATTERY COVER

Carefully read (BATTERY).

**NOTE** Place the vehicle on a flat, hard surface.

- Make sure that the ignition switch is set to "⊗".
- Lift the saddle, see (LOCKING/RELEASING THE SADDLE).
- Remove the rug lining the helmet compartment.
- Unscrew and remove the two screws (1).
- Slide the battery cover (2) out from below, being careful with the upper tabs (3).
- Disconnect the electrical connector (4) for the helmet compartment lighting.
- Remove the battery cover (2).

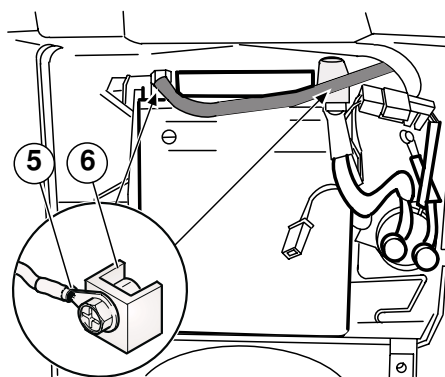


## CHECKING AND CLEANING TERMINALS

- Remove the battery cover, see alongside (REMOVING THE BATTERY COVER).
- Make sure that the battery cable terminals (5) (6) are:
  - in good condition (not corroded or encrusted with deposits);
  - covered with neutral grease or Vaseline.

If necessary:

- Disconnect the negative (–) and positive (+) cables in order.
- Clean with a wire brush to remove any traces of corrosion.
- Connect the positive (+) and negative (–) cables in order.
- Coat the terminals with neutral grease or Vaseline.

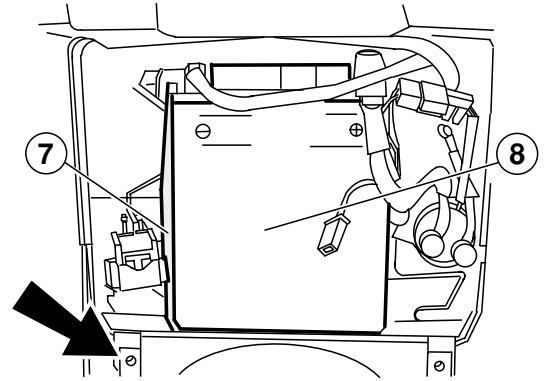


### ⚠ CAUTION

**Tighten the terminal screws well.**

## REMOVING THE BATTERY

- Remove the battery cover, see alongside (REMOVING THE BATTERY COVER).
- Remove the battery bleed tube (7).
- Slide the battery (8) out of its seat, turning it slightly to the right as shown by the arrow.
- Disconnect the negative cable (-) and positive cable (+), in that order.
- Remove the battery (8) completely from its housing and place it on a flat surface, in a cool, dry place.



### ⚠ WARNING

The removed battery must be stored in a safe place and out of the reach of children.

- Replace the battery cover, see alongside (REMOVING THE BATTERY COVER).

### ⚠ CAUTION

Handle with extreme care, since without bleeding it may leak electrolyte.

## LEAVING THE BATTERY IDLE FOR LONG PERIODS

Read the BATTERY section carefully.

If the vehicle is not in use for a long period of time, remove the battery and place it in a cool, dry place. Recharge the battery fully using a slow charge.

If the battery remains on the vehicle, disconnect the cables from the terminals.

During the winter, or when the vehicle remains idle, it is important to check the battery charge on a regular basis (around once every month) to prevent it from deteriorating.

## CHECKING THE LEVEL OF BATTERY ELECTROLYTE

To check the electrolyte level:

- Remove the battery cover, see (REMOVING THE BATTERY COVER).
- Make sure that the fluid level is between the two “**MIN**” and “**MAX**” notches stamped on the side of the battery.

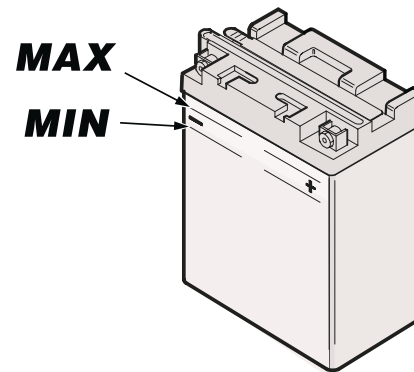
Otherwise:

- Remove the plugs from the elements.

### ⚠ CAUTION

**Use only distilled water to top up the electrolyte fluid. Do not exceed the reference “MAX”, since the level increases during recharging.**

- Restore the fluid level by adding distilled water.



## BATTERY RECHARGING

- Remove the battery, see (REMOVING THE BATTERY).
- Remove the plugs from the elements.
- Check the level of battery electrolyte, see alongside (CHECKING THE LEVEL OF BATTERY ELECTROLYTE).
- Connect the battery to a battery charger.
- We recommend recharging using an amperage 1/10 of the battery capacity.
- Once recharging is complete, check the electrolyte level again and top up with distilled water if necessary.
- Replace the plugs on the elements.

### ⚠ CAUTION

**Wait 5-10 minutes after shutting off the charging device before mounting the battery, since it will continue to produce gas for a short time.**

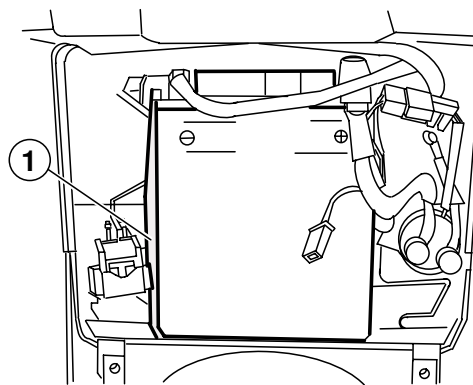
## BATTERY INSTALLATION

- Remove the battery cover, see (REMOVING THE BATTERY COVER).
- Place the battery in its housing.

### ⚠ CAUTION

**Always connect the battery bleed to the prevent escaping sulfuric acid fumes from corroding the electrical system, painted parts, rubber parts or gaskets.**

- Connect the positive (+) and negative (–) cables, in that order.
- Coat the terminals with neutral grease or Vaseline.
- Connect the battery bleed tube (1).
- Replace the battery cover, see (REMOVING THE BATTERY COVER).



## SPARK PLUG

### Carefully read (MAINTENANCE).

Check the spark plug every 3,750 mi (6,000 km) and replace every 7,500 mi (12,000 Km).

Periodically remove the spark plug, clean to remove carbon deposits, and replace if necessary.

To access the spark plug:

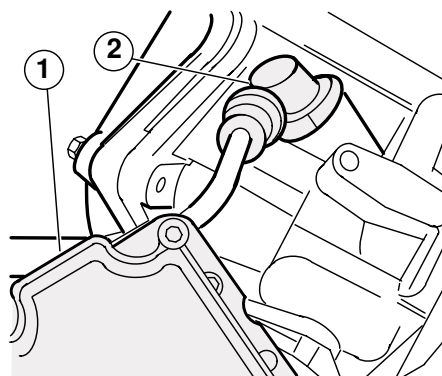
- Remove the left inspection cover, see (REMOVING THE RIGHT AND LEFT INSPECTION COVERS).

To remove and clean:

### ⚠ WARNING

**Before proceeding to the next steps, let the engine and muffler cool to ambient temperature, to avoid burns.**

- Move the coolant hose (1) for better access.
- Disconnect the cap (2) of the spark plug high voltage cable.
- Remove all traces of dirt from the base of the spark plug, then use the wrench provided in the tool kit to unscrew and extract it from its seat, being careful not to allow any dust or other substances into the cylinder.
- Make sure that the electrode and center porcelain of the spark plug are free of carbon deposits or any signs of corrosion. Clean if necessary with special spark plug cleansers, using a wire and/or metal brush.



- Use a strong blast of compressed air to prevent the residue removed from entering the engine. The spark plug must be replaced if it shows cracked insulation, corroded electrodes or excessive buildup.
- Use a gauge to measure the spark plug gap. It should be **0.027-0.031 in (0.7-0.8 mm)**; adjust if necessary, carefully bending the earth electrode.
- Make sure that the gasket is in good condition. With the gasket in place, screw in the spark plug by hand to avoid damaging the thread.
- Tighten using the wrench provided in the tool kit, turning each spark plug 1/2 turn to compress the gasket.

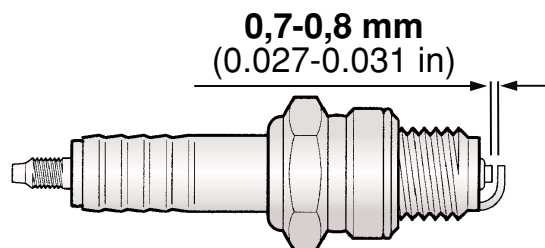
**Tightening torque for spark plug:**  
**12-14 Nm (1.2-1.4 kgm).**

#### ▲ CAUTION

**The spark plug must be firmly tightened, otherwise the engine might overheat and suffer serious damage.**

**Use only the recommended type of spark plugs, see (TECHNICAL SPECIFICATIONS); otherwise you may compromise the performance and life-span of the engine.**

- Insert the spark plug cap correctly, so that it does not vibrate off.
- Remount the left inspection cover, see (REMOVING THE RIGHT AND LEFT INSPECTION COVERS).



SPARK PLUG	Standard	CHAMPION RG6YC
	- Alternatively	NGK - CR7EKB
	Spark plug gap	0.027 - 0.031 in (0.7 - 0.8 mm)

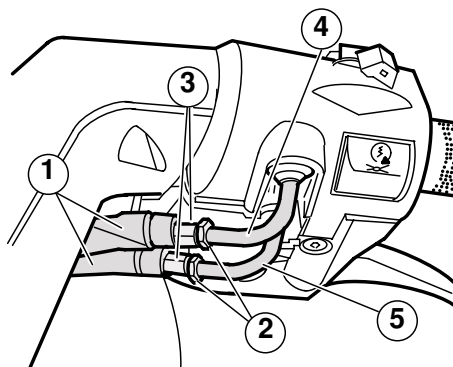
## ADJUSTING THE THROTTLE CONTROL

**Carefully read MAINTENANCE.**

The play of the throttle adjuster must be **0.078 - 0.118 in (2 - 3 mm)**, measured at the edge of the grip.

If not, proceed as follows:

- Place the vehicle on the center stand.
- Pull back the rubber boot (1).
- Loosen the lock nut (2).
- Rotate the adjuster (3) so as to restore the proper play.
- After completing the adjustment, tighten the lock nut (2) and check the clearance again.
- Replace the rubber boot (1).
- The cable (4) opens the gas.
- The cable (5) closes the gas.



#### ▲ WARNING

**After completing the adjustment, make sure that turning the handlebar does not alter the engine idle speed, and that when the throttle is released it returns gently and automatically to its original position.**

## AIR FILTER

### Carefully read MAINTENANCE.

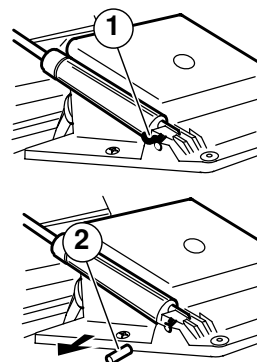
You should clean and check the condition of the air filter every 3,750 mi (6,000 km), depending on use.

If the vehicle is used on dusty or wet roads, clean or change the filter more frequently.

The filter element must be removed from the vehicle for cleaning.

### REMOVAL

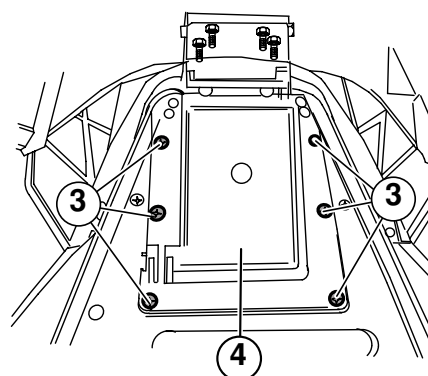
- Place the vehicle on the center stand.
- Lift the saddle as described on (LOCKING/RE-LEASING THE SADDLE).
- Remove the safety clip (1).
- Slide out the pin (2) fastening the piston to the air filter cover, as shown by the arrow.



### ⚠ CAUTION

**While removing the pin, be careful to support the saddle to keep it from falling.**

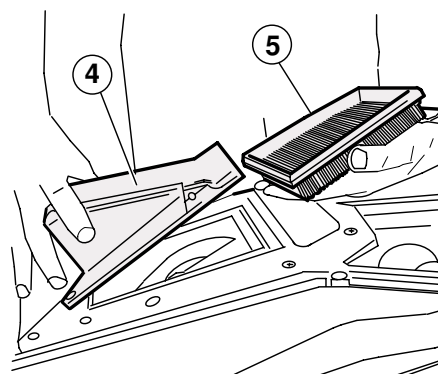
- Holding up the saddle, unscrew and remove the six screws (3) fastening the air filter cover to the saddle support lower molded cover.



### ⚠ CAUTION

**While lifting the air filter cover, make sure not to disconnect the intake coupling of the filter case.**

- Carefully lift the air filter cover (4).
- Remove the air filter (5).



### CLEANING

### ⚠ WARNING

**Do not use fuel or flammable solvents to wash the filter element, to avoid the risk of fire or explosion. Never use additives or any cleaning fluid, to prevent moisture from forming inside the filter case. Use only compressed air.**

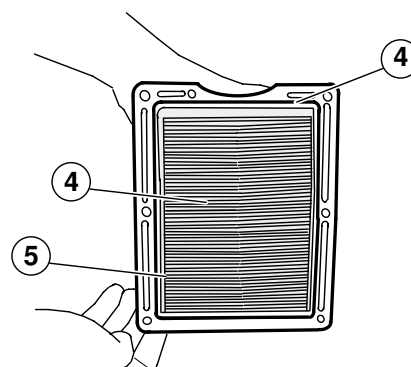
- Clean the filter element (5) using compressed air.

### ⚠ CAUTION

**DO NOT OIL THE FILTER ELEMENT, as this will interfere with proper functioning of the filter and engine.**

### ⚠ CAUTION

**When reassembling the filter (5), insert it in the filter cover (4) (making sure that the gasket adheres to the seat), then screw the cover onto the filter case.**





## ENGINE OIL

Check the engine oil after the first 625 miles (1,000 km), that is, at the end of the run-in period. Check the oil again every 1,875 miles (3,000 km). Oil must be replaced every 3,750 miles (6,000 km), see ENGINE OIL CHANGE AND OIL FILTER.

**NOTE** Use oil with 5/W 40 specifications, see (LUBRICANT CHART).

### ⚠ CAUTION

When topping up engine oil, we recommend that you never exceed the “MAX” level.

## CHECKING THE OIL LEVEL ENGINE AND TOPPING UP

Carefully read LUBRICANTS, MAINTENANCE and LUBRICANT CHART.

### CHECKING

**NOTE** Place the vehicle on a flat, hard surface.

- Place the vehicle on the center stand.

### ⚠ WARNING

The engine and exhaust system components become very hot, and remain hot for some time even after the engine has been shut off. Before handling these components, wear insulating gloves or wait until the engine and exhaust system have cooled down.

- Stop the engine and let it cool, to allow the oil to drain into the half-case and cool.

**NOTE** If you do not carry out the previous operations, you risk taking an incorrect measurement of the engine oil level.

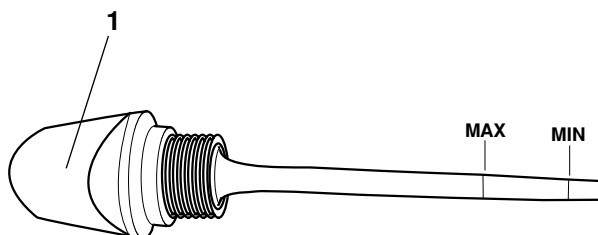
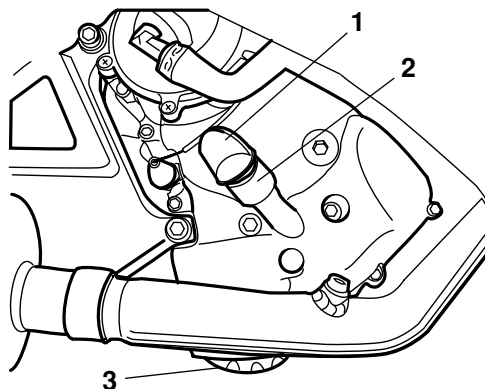
- Unscrew and extract the cap-dipstick (1).
- Use a clean cloth to clean the part in contact with the oil.
- Fully tighten the cap-dipstick (1) in the filling hole (2).
- Extract the cap-dipstick (1) again and read the level that oil reaches on the stick:

**MAX** = maximum level;

**MIN** = minimum level.

The difference between “MAX” and “MIN” is approximately: – 24.4 cu.in (400 cc)

- The level is correct if it reaches approximately the “MAX” level marked on the dipstick.



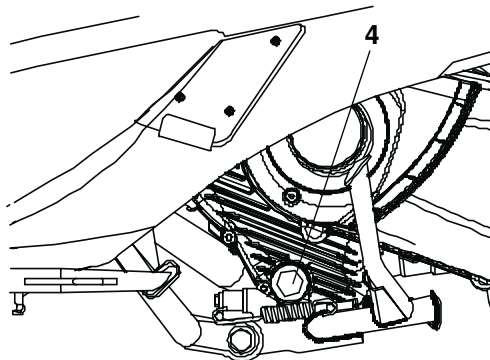
**⚠ CAUTION**

Do not fill beyond the “MAX” marking or below the “MIN” marking to avoid seriously damaging the engine.

- Top up if necessary.

**TOPPING UP**

- Add a small amount of oil through the filling hole (2) and wait about a minute for the oil to flow evenly within the half-case.
- Check the oil level, and top up if necessary.
- Top up with small amounts of oil until the prescribed level is reached.
- When you have finished, tighten the cap/dipstick (1).

**⚠ WARNING**

Never use the vehicle with insufficient lubrication or with contaminated or inappropriate lubricants, as these accelerate wear on moving parts and may cause irreparable damage.

**ENGINE OIL CHANGE AND OIL FILTER**

Check the level of the engine oil every 1,875 miles (3,000 km), see (CHECKING THE ENGINE OIL LEVEL AND TOPPING UP).

**NOTE** Use oil with 5/W 40 specifications, see (LUBRICANT CHART).

**When topping up engine oil, we recommend that you never exceed the “MAX” level.**

It is necessary to check the engine oil after the first 625 miles (1,000 km) and then:

- every 3,750 miles (6,000 km) replace oil.
- every 1,875 miles (3,000 km) check level/top up.

**NOTE** Place the vehicle on a flat, hard surface.

- Place the vehicle on the center stand.

**⚠ WARNING**

The engine and exhaust system components become very hot, and remain hot for some time even after the engine has been shut off. Before handling these components, wear insulating gloves or wait until the engine and exhaust system have cooled down.

- Stop the engine and let it cool, to allow the oil to drain into the half-case and cool.

**NOTE** If you do not carry out the previous operations, you risk taking an incorrect measurement of the engine oil level.

- Unscrew and extract the cap-dipstick (1).
- Unscrew and remove the engine oil cartridge filter (3).

**⚠ WARNING**

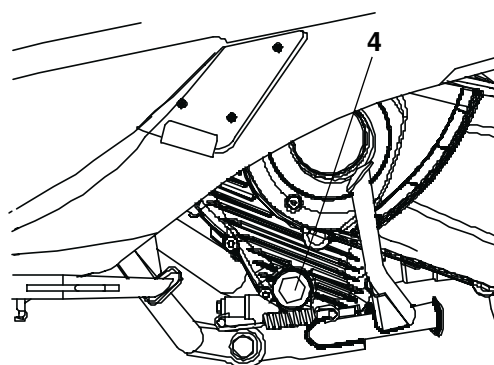
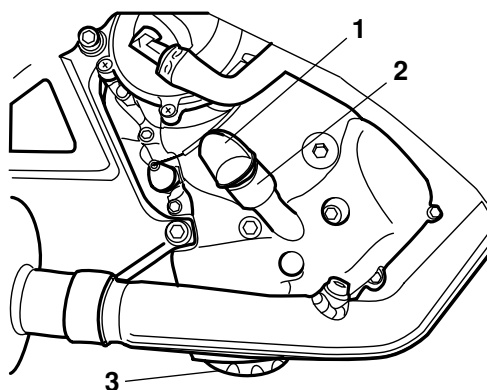
Never use the vehicle with insufficient lubrication or with contaminated or inappropriate lubricants, as these accelerate wear on moving parts and may cause irreparable damage.

**⚠ WARNING**

The oil used contains substances hazardous to the environment; therefore, to change the engine oil contact an **aprilia** dealer, who will dispose of the used oil in compliance with current regulations.

- Unscrew and remove the oil drain plug (4) and let all of the engine oil flow out.
- Install a new oil cartridge filter (3), being careful to lubricate the O-ring gaskets on the filter with oil.
- Tighten the engine oil drain plug (4).
- Fill through the filling hole (2) with approximately 103.7 cu.in (1700 cc) of engine oil.
- Tighten the oil level dipstick (1).
- Start the vehicle and let it run for a few minutes. Shut it off and let it cool. Check the engine oil level again using the dipstick (1), and top up if necessary, without ever exceeding the **"MAX"** level.

When topping up and changing oil, use new oil of the type 5/W 40 synthetic oil SAE that exceeds API ST specifications.



## CHECKING AND TOPPING UP THE TRANSMISSION OIL LEVEL

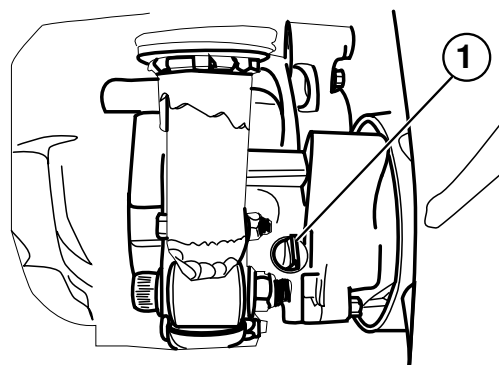
Carefully read LUBRICANTS, MAINTENANCE and LUBRICANT CHART.

**NOTE** Place the vehicle on a flat, hard surface.

- Place the vehicle on the center stand.

**⚠ WARNING**

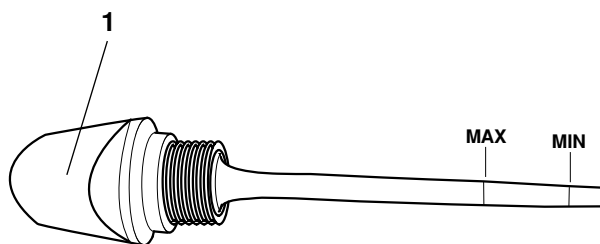
The engine and exhaust system components become very hot, and remain hot for some time even after the engine has been shut off. Before handling these components, wear insulating gloves or wait until the engine and exhaust system have cooled down.



- Unscrew and extract the cap-dipstick (1).
- Use a clean cloth to clean the part in contact with the oil.
- Fully tighten the cap-dipstick (1) in the filling hole (2).
- Extract the cap-dipstick (1) again and read the level that oil reaches on the stick:

**MAX** = maximum level

**MIN** = minimum level



- The level is correct if it approximately reaches the “MAX” level marked on the dipstick.

**⚠ CAUTION**

**Do not go above the “MAX” marking or below the “MIN” marking, as this could seriously damage the engine.**

- Top up if necessary.

**TOPPING UP**

- Add a small amount of oil through the filling hole (2) and wait about a minute for the oil to flow evenly within the half-case.
- Check the oil level, and top up if necessary.
- Top up with small amounts of oil until the prescribed level is reached.
- When you have finished, tighten the cap-dipstick (1).

SAE 80W/90 OIL THAT EXCEEDS API GL3 SPECIFICATIONS.

**⚠ WARNING**

**Never use the vehicle with insufficient lubrication or with contaminated or inappropriate lubricants, as these accelerate wear on moving parts and may cause irreparable damage.**

## CHANGING THE TRANSMISSION OIL

Carefully read LUBRICANTS, MAINTENANCE and LUBRICANT CHART.

**NOTE** Place the vehicle on a flat, hard surface.

- Place the vehicle on the center stand.

### ⚠ WARNING

The engine and exhaust system components become very hot, and remain hot for some time even after the engine has been shut off. Before handling these components, wear insulating gloves or wait until the engine and exhaust system have cooled down.

- Stop the engine and let it cool, to allow the oil to drain into the half-case and cool.

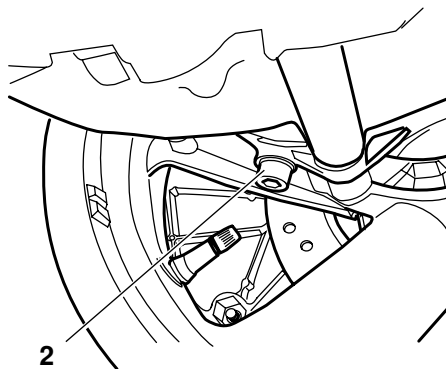
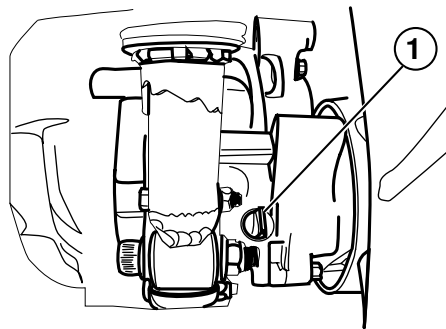
**NOTE** If you do not carry out the previous operations, you risk taking an incorrect measurement of the transmission oil level.

### ⚠ WARNING

When changing the transmission oil, make sure it does not come into contact with the rear brake disc.

- Unscrew and extract the cap-dipstick (1).
- Unscrew and remove the transmission oil drain screw (2).
- Let the transmission oil flow out completely into an appropriately sized container.
- Screw and tighten the transmission oil drain screw (2).
- Top up the transmission with approximately 18.3 cu.in (300 cc) of oil of the type prescribed in the lubricant chart.
- Tighten the cap-dipstick (1).
- Check the transmission fluid level again using the dipstick (1) and top up if necessary, without ever exceeding the "MAX" level.

When topping up and changing oil, use new oil of the type indicated in the LUBRICANT CHART.



## DISC BRAKES

**NOTE** This vehicle is fitted with front and rear disc brakes with separate hydraulic systems. Check the wear of the brake pads after the first 625 mi (1,000 km), and every 1,250 mi (2,000 km) thereafter. The wear of the disc brake pads depends on use, riding style and road conditions.

### ⚠ WARNING

The following information refers to a single brake system but is valid for both systems.

Sudden play variations or elastic resistance on the brake lever are caused by malfunctions in the hydraulic system.

### ⚠ WARNING

Take special care of the brake disc and friction gaskets, making sure that they are not oily or greasy, especially after checks and maintenance operations.

Make sure that the brake pipe is not twisted or worn.

KEEP OUT OF REACH OF CHILDREN.

DISPOSE OF FLUID CORRECTLY.

**⚠ WARNING**

The brakes are the parts that guarantee the most safety and therefore, they must always be kept in perfect working order.

Always check the brakes before using the vehicle.

A dirty disc will soil pads, which will lead to a reduction in braking efficiency. Dirty pads must be replaced, while a dirty disc must be cleaned using a high-quality degreaser.

Brake fluid must be replaced every two years.

**NOTE** This vehicle is fitted with front and rear disc brakes, with separate hydraulic systems.

The following information refers to a single brake system but is valid for both systems.

As the pads wear out, the brake fluid level in the tank falls to automatically compensates for their wear. The brake fluid tanks are located beneath the handlebar cover, close to the brake lever couplings. Check the level of brake fluid in the tanks on a regular basis, see (CHECKING) as well as the wear of the pads, see (CHECKING WEAR OF THE BRAKE PADS).

**⚠ WARNING**

Do not use the vehicle if any liquid is leaking from the brake system.

**CHECKING**

To check the level:

**NOTE** Place the vehicle on a firm, flat surface.

- Place the vehicle on the center stand.
- Turn the handlebar so that the fluid in the brake fluid tank is parallel to the “MIN” mark on the glass gauge (1).
- Check that the fluid in the tank is over the “MIN” mark on the glass gauge (1).

**MIN** = minimum level.

If the fluid does not reach the “MIN” mark:

**⚠ CAUTION**

As the pads wear out, the brake fluid level falls progressively.

- Check the wear of the brake pads, (CHECKING WEAR OF THE BRAKE PADS) and the disc.

**⚠ CAUTION**

Check the efficiency of the brake system. In the event of excessive brake lever stroke or reduced brake system efficiency, it may be necessary to bleed air from the system.





## TOPPING UP BRAKE FLUID

### Carefully read DISC BRAKES.

Unscrew the four screws (2) of the brake fluid tank (3). Remove the cover (4).

**NOTE** In order not to spill brake fluid during topping up, keep the fluid in the tank parallel to the tank rim (in a horizontal position).

Remove the gasket below the cover.

**NOTE** As a reference for the maximum level "MAX", top up until the glass gauge (1) is completely covered, with the rim of the brake fluid tank parallel to the ground.

### ⚠ CAUTION

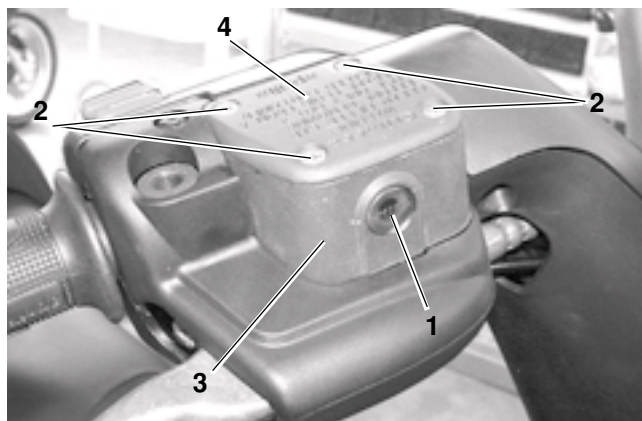
**Topping up to the "MAX" level must only be carried out when new pads have been fitted.**

**As the pads wear out, the brake fluid level falls progressively.**

**Do not fill the tank to "MAX" with worn pads. This will cause the fluid to overflow from the tank when the pads are replaced.**

Fill the tank (3) with brake fluid, LUBRICANT CHART, until the glass gauge (1) is completely covered.

To refit the parts, follow this procedure in reverse.



## CHECKING WEAR OF THE BRAKE PADS

### Carefully read DISC BRAKES.

**The following information refers to a single brake system but is valid for both systems.**

Check the wear of the brake pads after the first 625 mi (1,000 km), and every 1,250 mi (2,000 km) thereafter. The wear of the disc brake pads depends on use, riding style and road conditions.

Wear is increased during use on dirty or wet roads.

### ⚠ WARNING

**It is especially important to check the wear of the brake pads before every trip.**

To quickly check the wear on the pads:

- Place the vehicle on the center stand.
- Visually inspect the brake disc and pads, as follows:

### FRONT BRAKE CALIPERS

- Check from the front, looking upwards, for both calipers.

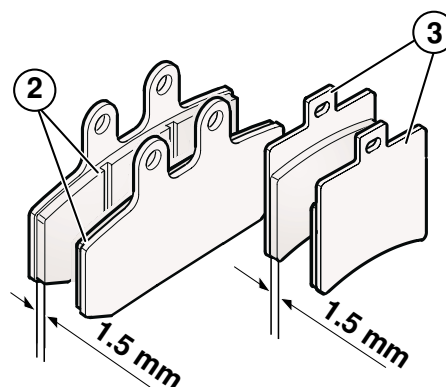
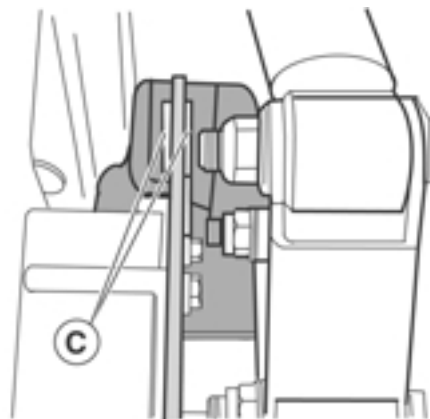
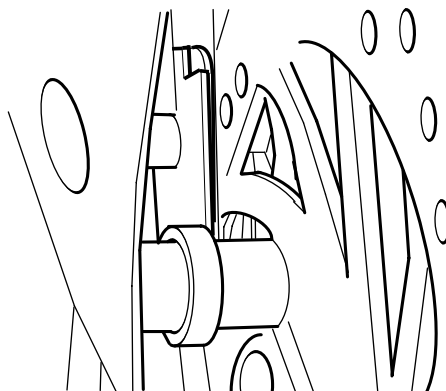
### REAR BRAKE CALIPER

- Check from the rear, looking upwards, for both pads (C).

### ⚠ WARNING

**Excessive wear on the pad friction material would cause the metal pad support to come into direct contact with the disc, creating a metallic grinding noise and producing sparks from the clamp; the braking effectiveness, safety and integrity of the disc would thus be compromised.**

- If the thickness of the friction material (even of a single pad) is reduced to approximately 0.059 in (1.5 mm), replace both pads.
- Front pads (2).
- Rear pads (3).



## BLEEDING THE BRAKING SYSTEM (FRONT ONLY)

Carefully read **DISC BRAKES**.

If air is present in the hydraulic system, it acts as a bearing and absorbs the majority of the pressure exercised by the brake pump, reducing the effectiveness of caliper action during braking.

You can tell if there is air in the system from the "sponginess" of the brake control and reduced braking efficiency.

### ⚠ WARNING

Since these conditions would be extremely dangerous for the vehicle and the rider, it is absolutely necessary to bleed the hydraulic system after the brakes have been refitted and normal conditions of brake system use have been restored.

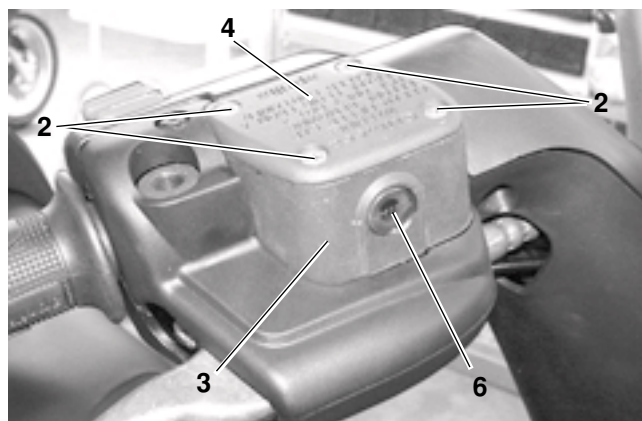
Unscrew the four screws (2) of the brake fluid tank (3). Remove the cover (4).

**NOTE** In order not to spill brake fluid during topping up, keep the fluid in the tank parallel to the ground.

Remove the gasket above the cover.

Make sure that the level of the fluid completely covers the glass gauge (6) and top up if necessary.

Remove the protection cap (7) from the bleeder nipple. Connect a transparent tube (9) to the bleeder nipple (8).



### ⚠ CAUTION

**Do not contaminate the pads or the disc with brake fluid.**

Place the free end of the transparent tube into a container (10).

Slowly pull the brake lever through its full stroke two or three times, then keep it in a fully pulled position.

Loosen the bleeder nipple (8), press the lever and check that together with brake fluid, air bubbles come out from the transparent tube.

### ⚠ CAUTION

**Before releasing the brake lever, tighten the bleeder nipple (8), to prevent air from entering the brake system.**

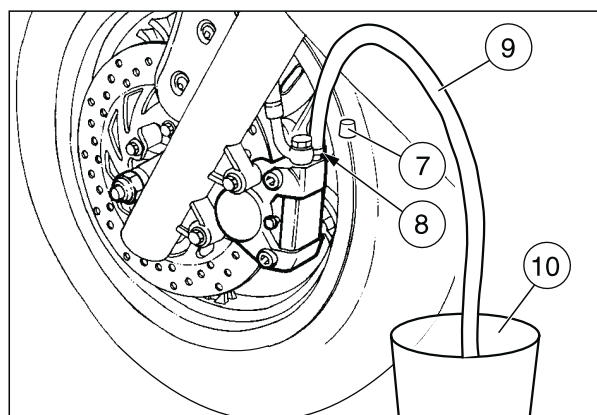
When only brake fluid comes out, tighten the bleeder nipple (8) and release the brake lever.

**Bleeder nipple (8) tightening torque: 14 Nm (1.4 kgm).**

**NOTE** Repeat the last three operations until all air bubbles have been eliminated.

### ⚠ CAUTION

**After reassembly, pull the brake lever repeatedly and check that the brake system is operating correctly.**





**BLEEDING THE INTEGRAL BRAKING SYSTEM****Carefully read DISC BRAKES.**

If air is present in the hydraulic system, it acts as a bearing and absorbs the majority of the pressure exercised by the brake pump, reducing the effectiveness of caliper action during braking.

You can tell if there is air in the system from the “sponginess” of the brake control and reduced braking efficiency.

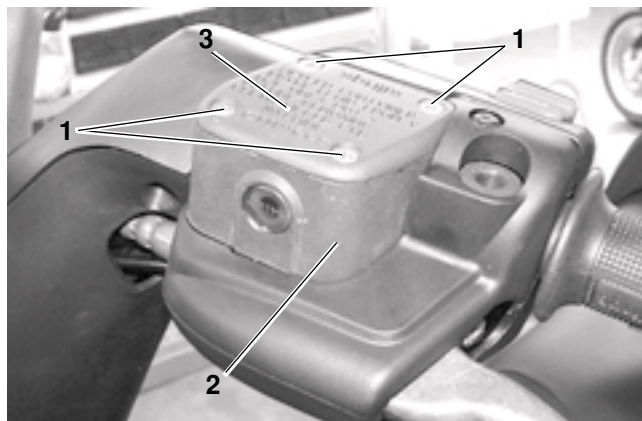
**⚠ WARNING**

**Since these conditions would be extremely dangerous for the vehicle and the rider, it is absolutely necessary to bleed the hydraulic circuit after the brakes have been refitted and normal conditions of brake system use have been restored.**

**NOTE** The left-hand pump lever acts on the rear caliper and on the front right-hand caliper.

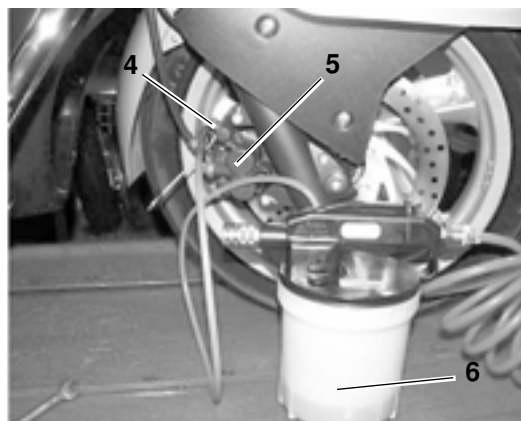
Unscrew the four screws (1) from the brake fluid tank (2).  
Remove the cover (3).

**NOTE** In order not to spill brake fluid during topping up, keep the fluid in the tank parallel to the ground.

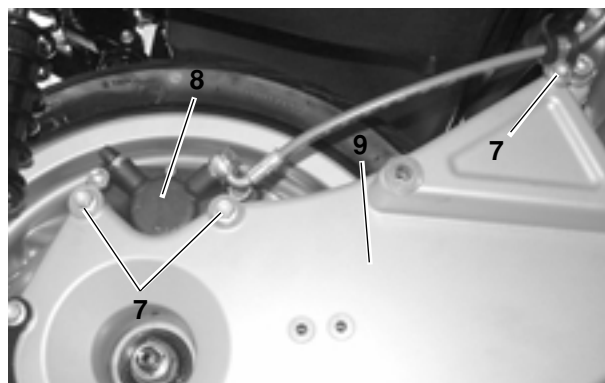


Suck out the oil from the bleeder nipple (4) of the front right-hand caliper (5) using the specific equipment (6), and unscrewing the bleeder nut (4) by half a turn.

Top up the oil in the brake fluid tank (2) approx. 2-3 times.



Unscrew and remove the three screws (7).  
Remove the rear brake caliper (8) from the plate (9) with relevant cable gland.  
Position the rear brake caliper (8) so that the bleeder nipple (10) is in the highest position.

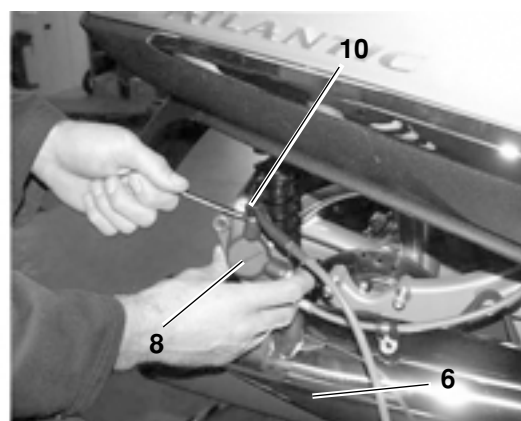


Suck out the oil from the bleeder nipple (10) of the rear brake caliper (10) using the specific equipment (6), and unscrewing the bleeder nut (10) by half a turn.

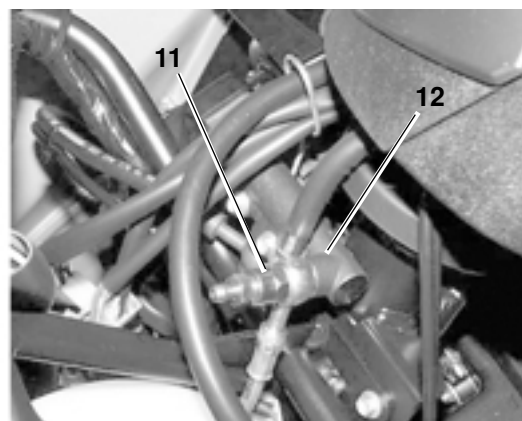
Top up the oil in the brake fluid tank (2) approx. 2-3 times.

**⚠ CAUTION**

**Never completely empty the oil from the fluid tank (2) in order to prevent air from entering the system.**



Proceed to refit the rear brake caliper.  
Remove the front outer shield see (REMOVING THE FRONT OUTER SHIELD).  
Suck out the oil from the bleeder nipple (11) of the delaying device (12) using the specific equipment and unscrewing the bleeder nut (11) by half a turn.



Pull the brake lever until air bubbles begin to come up in the tank.

Refit the cover (3) of the brake fluid tank (2).  
Refit the front outer shield, see (REMOVING THE FRONT OUTER SHIELD).

**NOTE** Repeat the bleeding operations if braking functions are not sufficient.

**CHECKING AND TOPPING UP COOLANT**

Carefully read **COOLANT** and **PRECAUTIONS AND GENERAL INFORMATION**.

**▲ CAUTION**

**Never use the vehicle if the coolant level is below minimum "MIN".**

Check the coolant level every 1,250 mi (2,000 km) and after long trips; replace every 16 months.

**DISPOSE OF COOLANT CORRECTLY.**

Place the vehicle on the center stand.

Remove the front outer shield, see (REMOVING THE FRONT OUTER SHIELD).

Make sure that the level of the coolant in the expansion tank (2), is between the "MIN" and "MAX" marks (see figure).

**▲ WARNING**

**Do not remove the plug of the expansion tank while the engine is warm, because the coolant is under pressure and at a high temperature. May cause serious burns and/or damage in contact with skin or clothes.**

If this is not the case, unscrew and remove the filling cap below the front outer shield.

Top up until the coolant level approximately reaches the "MAX" level.

Do not exceed this level, otherwise the coolant will spill out while the engine is running.

Replace the filler cap.

Refit the front outer shield.

**▲ CAUTION**

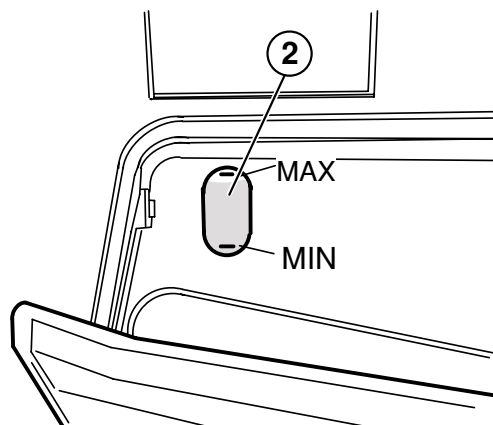
**If coolant is used up too quickly and the expansion tank becomes empty, check for leaks in the circuit.**

**Coolant is harmful: DO NOT DRINK.**

**KEEP OUT OF REACH OF CHILDREN.**

**▲ CAUTION**

**Only use nitrite-free antifreeze and anticorrosive products that guarantee protection to at least -31 °F (-35 °C).**



## REPLACING THE COOLANT

Carefully read COOLANT and PRECAUTIONS AND GENERAL INFORMATION.

### ⚠ CAUTION

**Never use the vehicle if the coolant level is below minimum "MIN".**

Check the coolant level every 1,250 mi (2,000 km) and after long trips; replace every 16 months.

### ⚠ CAUTION

**Switch off the engine and wait until both the engine and the exhaust system are cool.**

### DISPOSE OF FLUID CORRECTLY.

Place the vehicle on the center stand.

Remove the front outer shield, see (REMOVING THE FRONT OUTER SHIELD).

Remove the splash guard, see (REMOVING THE SPLASH GUARD).

### ⚠ CAUTION

**Do not remove the plug of the expansion tank while the engine is warm, because the coolant is under pressure and at a high temperature.**

**May cause serious burns and/or damage in contact with skin or clothes.**

Unscrew and remove the cap (1) of the expansion tank (2).

Place a container with a capacity of more than 91.5 cu. inches (1500 cc) under the base, beneath the outlet coupling.

Unscrew and remove the hose clamp (3) and disconnect the coupling.

Let the coolant flow out completely into the container, then pour it into a collection container for liquid recovery.

Replace the coupling and fix it into place with the hose clamp (3).

Pour 73.2 cu. inches (1200 cc) of coolant into the expansion tank (2).

Top up until the level of the coolant approximately reaches the "MAX" level.

Do not exceed this level, otherwise the coolant will spill out while the engine is running.

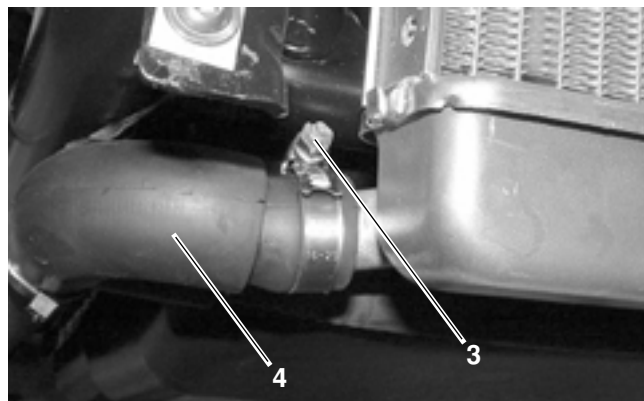
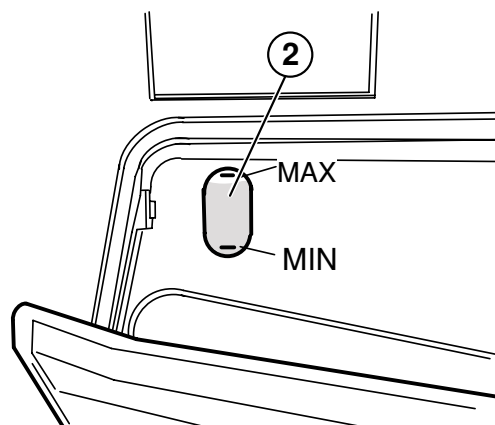
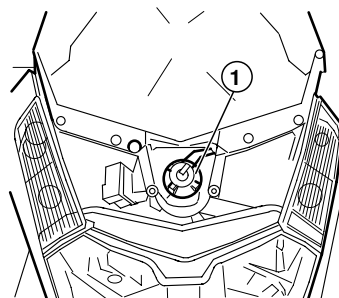
Replace the filler cap (1).

Remove the inspection cover, see (REMOVING THE LEFT AND RIGHT INSPECTION COVERS).

### ⚠ CAUTION

**Exhaust gases are dangerous to health.**

**Do not run the engine in closed or badly ventilated rooms.**



- Start the engine and leave it running at minimum running speed.
- Place a container under the engine to collect the coolant that will spill out from the bleeder screw (5).

**▲ CAUTION**

**The coolant is pressurized; loosen the bleeder screw (5) slowly and a little at a time in order to avoid splashing dangerous fluids.**

- Loosen the bleeder screw (5) on the thermostatic valve (6); let a small quantity of fluid flow out, together with any air bubbles, then tighten the bleeder screw (5).
- Check the level of the coolant in the expansion tank (2) and top up to the "MAX" level (to bleed it, see page 2-24 BLEEDING THE CIRCUIT).
- Run the engine for a few kilometers until it reaches normal working temperature.

**▲ CAUTION**

**Switch off the engine and wait until both the engine and the exhaust system are cool.**

Follow these steps in reverse order to refit the plastic parts.

**▲ CAUTION**

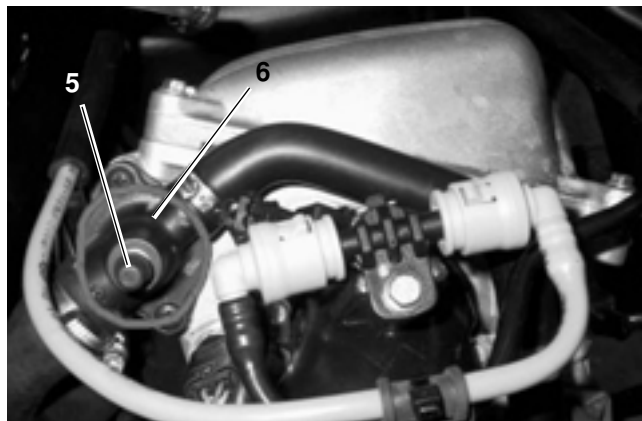
**If coolant is used up too quickly and the expansion tank becomes empty, check for leaks in the circuit.**

**Coolant is harmful: DO NOT DRINK.  
KEEP OUT OF REACH OF CHILDREN.**

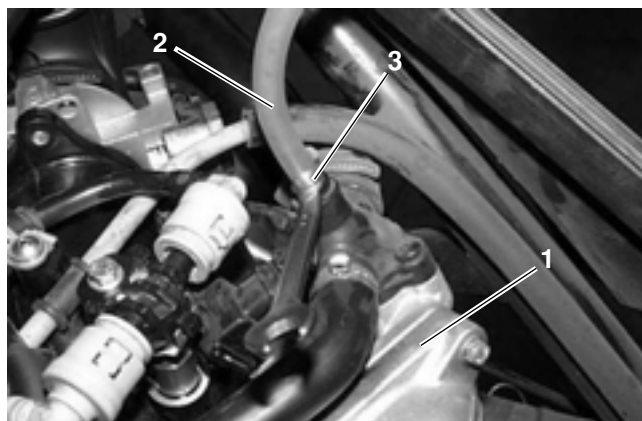
**▲ CAUTION**

**Only use nitrite-free antifreeze and anticorrosive products that guarantee protection to at least -31 °F (-35 °C).**

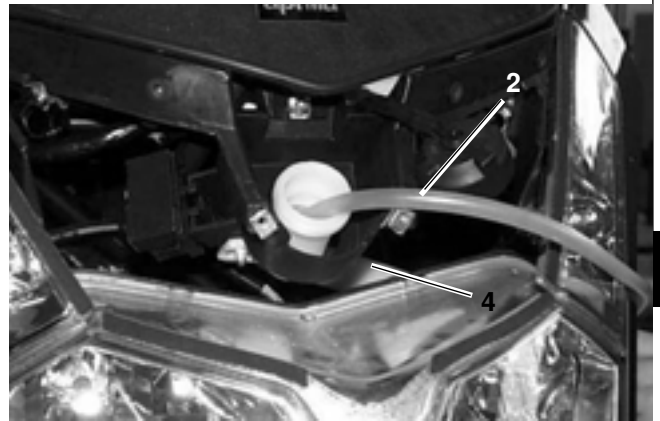
For information about the cooling system, see (COOLING SYSTEM).

**BLEEDING THE CIRCUIT:**

- Remove the front outer shield, see (REMOVING THE FRONT OUTER SHIELD).
- Remove the filter box, see (REMOVING THE FILTER CASE).
- Open the expansion tank cap.
- Remove the protective cap of the bleeder nipple, situated on the union tee of the cylinder head (1).



- Connect a transparent rubber pipe (2) between the bleeder and the expansion tank.
- Open the bleeder nut (3) by half a turn.
- Fill the expansion tank (4) with coolant until it reaches the max. mark (this can be seen in the window in the front compartment).



- Start the engine.
- The circuit air bubbles out from the transparent rubber pipe (2).
- Check that the pipe connected to the radiator expansion tank is spilling fluid into the expansion tank (it can be seen from the front side). This means that the thermostatic valve is open and the circuit is filled up.
- Close the bleeder nipple.

**NOTE** The fact that the electric cooling fan switches on is not indicative, since the sensor which triggers the fan is fitted to the cylinder head and not to the radiator.

## STEERING CONTROL

**Carefully read MAINTENANCE.**

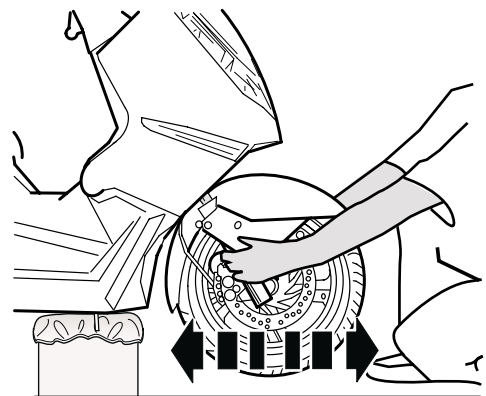
You should occasionally check for any play in the steering.

To check:

Place the vehicle on the center stand.

**NOTE** Make sure the support is high and broad enough to support the vehicle safely.

- Inserting an absorbent cloth, arrange the support under the vehicle so that the front wheel can move freely and the vehicle is protected against falling.



### ⚠ CAUTION

**Make sure the vehicle is stable.**

- Shake the fork fore and aft.

### ⚠ CAUTION

**Shaking the fork too hard could pick up the movement of the side stand, implying play where there is none. Repeat the above operation several times.**

- If there is clear indication of play, contact your nearest aprilia dealer, who will restore the vehicle to optimum condition.



**ADJUSTING THE PLAY OF THE BEARINGS**

Remove the leg shield, see (REMOVING THE LEG SHIELD).

Loosen the counter nut (1).

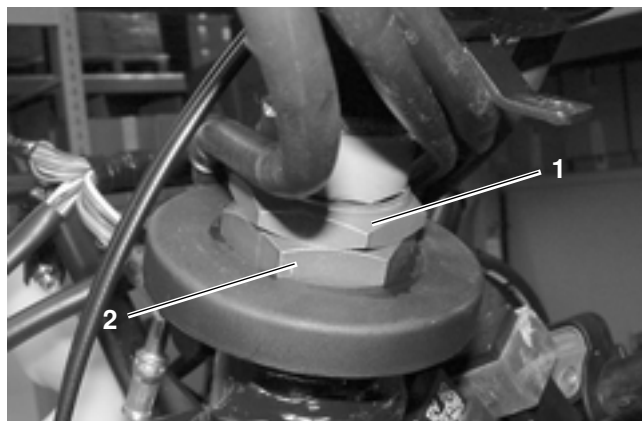
**⚠ CAUTION**

**Do not forcefully tighten or screw the register nut (2) in order not to damage the steering bearings.**

Tighten the register nut (2) until the bearing play has been recovered.

Check the play by shaking the fork in the direction of travel and making sure that steering turns both freely and fluidly.

Hold the register nut (2) firmly in position and tighten the counter nut (1) with a wrench.



**Counter nut (1) tightening torque:  
110 Nm (11 kgm).**

Repeat the penultimate operation.

**STEERING DAMPER**

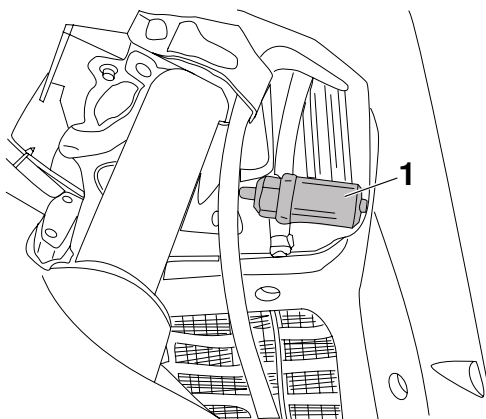
When traveling fully loaded (rider + passenger + luggage), it is possible to adjust the steering damper.

To adjust:

Turn the ring-nut (1) clockwise to increase the brake on the shock absorber.

**⚠ CAUTION**

**Tightening the ring-nut increases the adjuster brake on the shock absorber, and thus the effort needed to turn the handlebar, thereby decreasing ease of handling.**

**CHECKING THE ENGINE FULCRUM**

**Carefully read MAINTENANCE.**

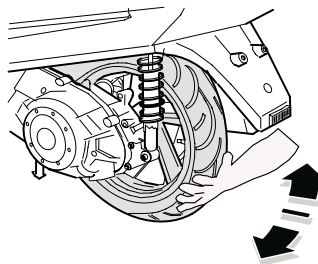
Periodically check the play between the engine pin bushings.

To check:

Place the vehicle on the center stand.

Shake the wheel from side to side.

If there is any play, check that all parts that fasten the axis fulcrum are firmly tightened, see (REMOVING THE ENGINE FROM THE FRAME).



## CHECKING THE FRONT SUSPENSION

### Carefully read PRECAUTIONS AND GENERAL INFORMATION.

Check the front suspension after the first 625 miles (1,000 km), and then every 3,750 miles (6,000 km) or every 8 months.

Replace the front suspension oil every 7,500 miles (12,000 km), see (FRONT SUSPENSION).

Check that the front fork shows no signs of oil leakage and that the outer surfaces of the rods are not scratched or grooved and if they are, replace all damaged parts.

Also make the following checks:

Pull the front brake lever and press repeatedly on the handlebar to move the fork downwards.

Travel must be smooth and there must be no sign of oil on the rods.

Check that all parts are correctly tightened and check the operation of the front suspension joints, see (FRONT SUSPENSION).

## CHECKING THE REAR SUSPENSION

### Carefully read PRECAUTIONS AND GENERAL INFORMATION.

Check the rear suspension after the first 625 miles (1,000 km) and then every 3,750 miles (6,000 km) or every 8 months.

Check that the shock absorbers show no sign of oil leakage.

Check that all parts are correctly tightened and check the operation of the rear suspension joints, see (REAR SUSPENSION).

#### ⚠ CAUTION

Check that both shock absorbers are calibrated to the same position.

To adjust, see (ADJUSTMENT).

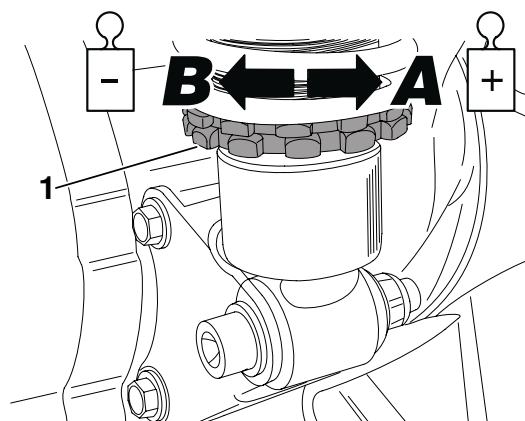
## ADJUSTING THE REAR SUSPENSION

The rear suspension is made up of a pair of dual-effect shock absorbers (braking in compression/extension), fastened via silent-block to the engine.

The standard factory setting allows for a rider weight of approximately 154.32 lbs (70 kg). For different weights and needs, adjust the ring-nut (1) with the pin wrench (provided), thus defining the ideal riding conditions (see table).

#### ⚠ CAUTION

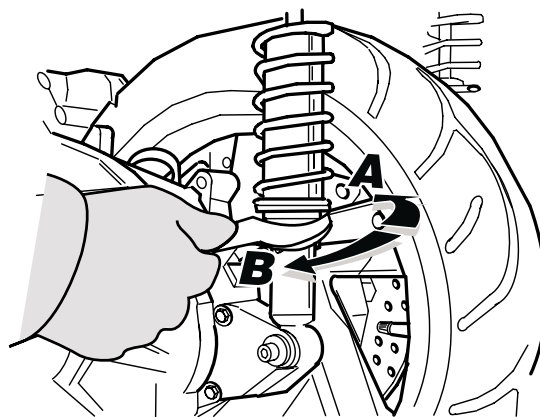
Set both shock absorbers to the same position.





## TABLE PRELOAD ADJUSTMENT FOR REAR SUSPENSION SPRING

Adjuster ring-nut	Rotation (arrow A)	Rotation (arrow B)
Function	Increase spring preload	Reduce spring preload
Type of riding position	The riding position of the vehicle is more rigid	The riding position of the vehicle is softer
Type of road recomm.	Roads with smooth or normal surface	Roads with uneven surface
Notes	Riding with a passenger	Riding without a passenger



## WHEELS AND TIRES

Carefully read PRECAUTIONS AND GENERAL INFORMATION.

### CHECKING THE WHEELS

Make sure that the wheel rims are neither cracked nor deformed. Replace if necessary.

Check the wheel eccentricity.

If it is deformed beyond tolerance limits, check the rim and the bearings.

Replace the wheel if necessary.

#### Eccentricity limits:

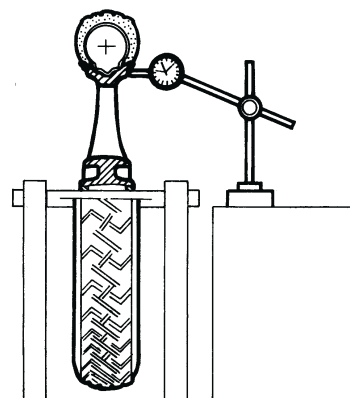
**Vertical: 0.078 in (2 mm)**

**Lateral: 0.078 in (2 mm)**

Check the wheel balancing.

Rotate the wheel slowly several times and observe the position in which it stops.

If the wheel is not statically balanced, it will always stop in the same place. Place a balancing weight on the lightest point of the wheel (top).



## TIRES

This vehicle is equipped with tubeless tires (no inner tube).

### ⚠ WARNING

Periodically check the inflation pressure of the tires at ambient temperature, see (TECHNICAL SPECIFICATIONS).

If the tires are warm, the measurement will not be correct.

Always measure before and after any long trips.

If the inflation pressure is too high, the shocks of rough terrain are not absorbed and are transmitted to the handlebars, making for an uncomfortable ride and also diminishing the vehicle's ability to adhere to curves.



If the tire is underinflated (pressure is too low), the sidewalls (1) are under greater stress and the tire itself may slip or detach from the rim with consequent loss of control.

The tires may slip off the rims if the rider brakes suddenly, and the vehicle may skid on curves.

Check the surface state and wear, since tires in poor condition do not adhere properly to the road and adversely affect vehicle handling.

Some types of tires, approved for use on this vehicle, come equipped with wear indicators. Various kinds of wear indicators are available. Ask your local dealer for instructions on how to check for wear. Visually inspect the tire condition and have them replaced if they are worn.

If the tires are old, even if they are not completely worn out, they may harden and be unable to ensure good adherence. In this case have the tires replaced.

Have the tire replaced if worn or if the tread area contains any puncture larger than 0.196 in (5 mm) across. After repairing a tire, have the wheels balanced.

Use only tires of the size indicated by the manufacturer, see (TECHNICAL SPECIFICATIONS).

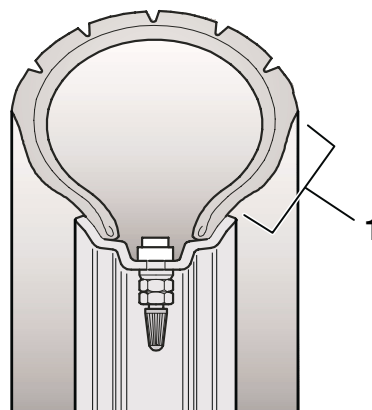
Never install tires with inner tubes on rims for tubeless tires, and vice-versa.

Make sure the inflation valves are always capped, to prevent the tires from deflating suddenly.


Changing, repairing, maintaining and balancing the tires are all very important tasks; they must therefore be carried out using the appropriate tools and expertise.


We therefore recommend that you contact your nearest **aprilia** dealer or tire specialist to perform the aforementioned operations.

If the tires are new, they may be covered with a slippery coating: drive carefully for the first few miles. Do not grease the tires with inappropriate substances.



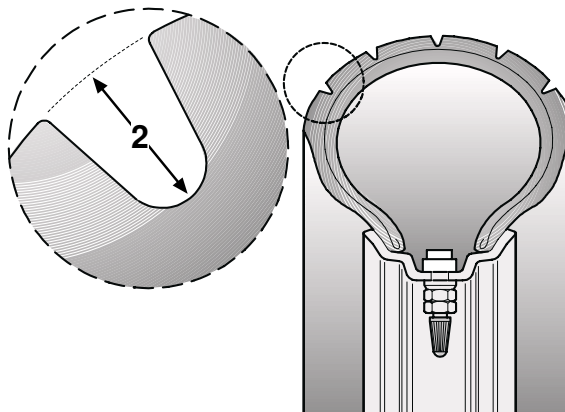
## MINIMUM TREAD DEPTH (2)

front:.....0.078 in [2 mm] (  0.118 in) [3 mm]

rear:.....0.078 in [2 mm] (  0.118 in) [3 mm]

Do not exceed the maximum weight limit. Overload of the vehicle will compromise its stability and handling, and may damage the tires.

MAX. LOAD 396.8 lbs (180 Kg)



## TIRE PRESSURE

	FRONT	REAR
ONLY RIDER	30.4 psi (2.1 bar)	33.3 psi (2.3 bar)
FULL LOAD (passenger + driver)	31.9 psi (2.2 bar)	37.7 psi (2.6 bar)

After thorough testing, **aprilia** has approved only the following makes of tire for this model:

	MANUFACTURER	DIMENSIONS	MODEL
FRONT	MICHELIN	120/70-15' 56S 140/60-14' 64S	GOLD STANDARD GOLD STANDARD
REAR			
FRONT	CHENG SHIN MAXXIS	120/70-15'56R 140/60-14' 64R	M-6002 M-6002
REAR			

Engine

3

## ENGINE COMPONENTS THAT CAN BE REMOVED WITHOUT REMOVING THE ENGINE

The parts listed below can be removed and refitted without removing the engine from the frame.

### TOP

- Throttle unit (1), see (THROTTLE UNIT)
- Intake manifold sleeve (2)
- Starter motor (3)
- Coolant thermistor (4) (above head)
- Injector (5)

### FRONT

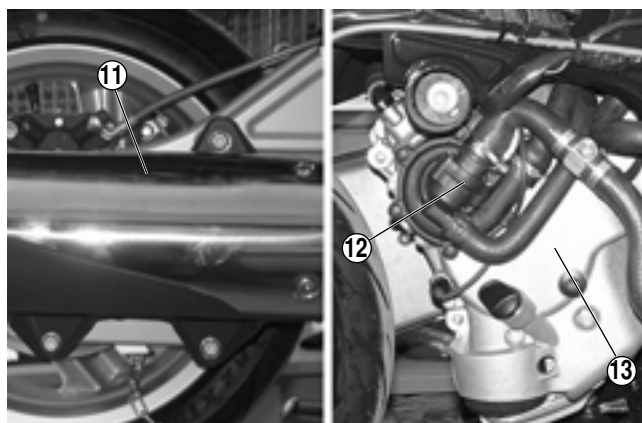
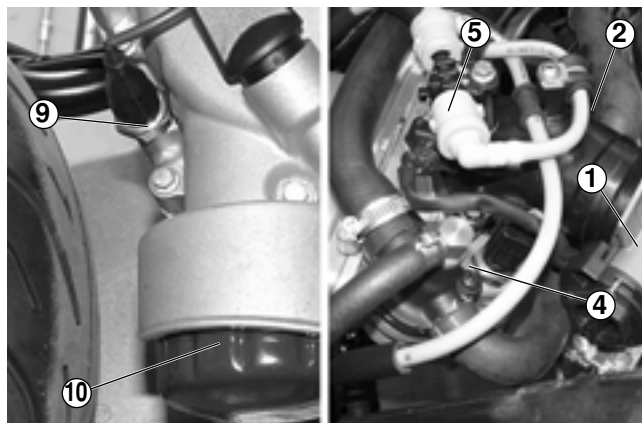
- Tappet cover (6)
- Head (7)
- Cylinder (8)

### RIGHT SIDE

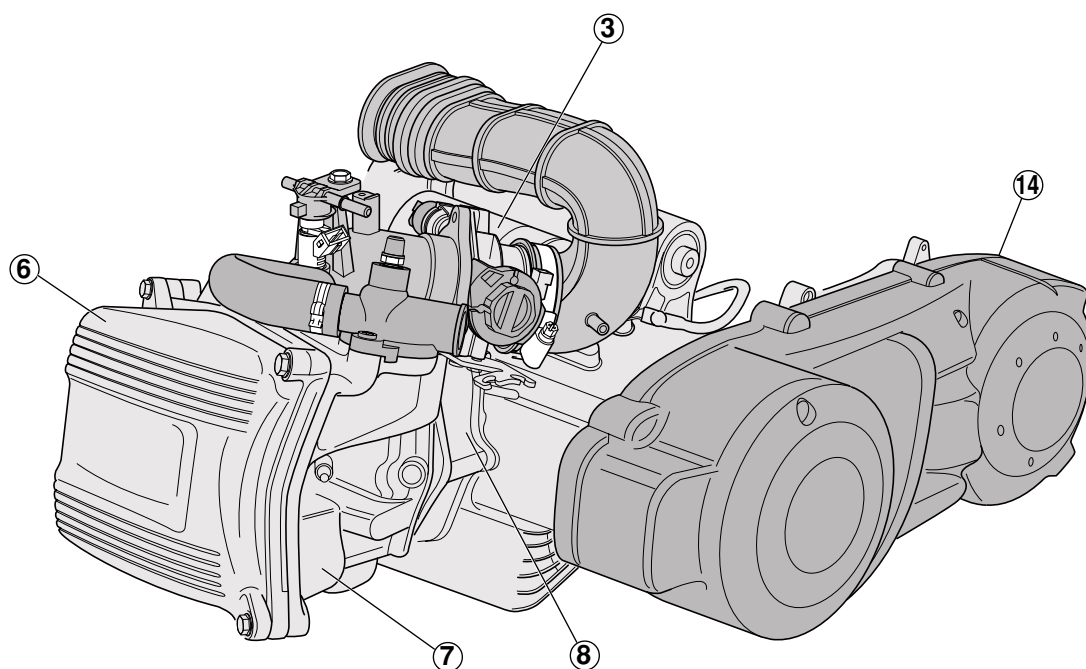
- Oil pressure sensor (9)
- Engine oil filter (10)
- Exhaust muffler (11) see (REMOVING THE EXHAUST MUFFLER)
- Water pump (12)
- Ignition casing (13)
- Flywheel
- Stator coil
- Pulse generator (pick-up)

### LEFT SIDE

- Transmission belt box air filter
- Transmission cover carter (14)
- Speed variator unit
- Clutch unit
- Drive belt



For removals of parts not described here, see ENGINE WORKSHOP MANUAL n°1063 **I**, n°1064 **E**, n°1065 **F**, n°1066 **D**, n°1067 **UK** and n°1068 **USA**.



## REMOVING THE ENGINE FROM THE FRAME

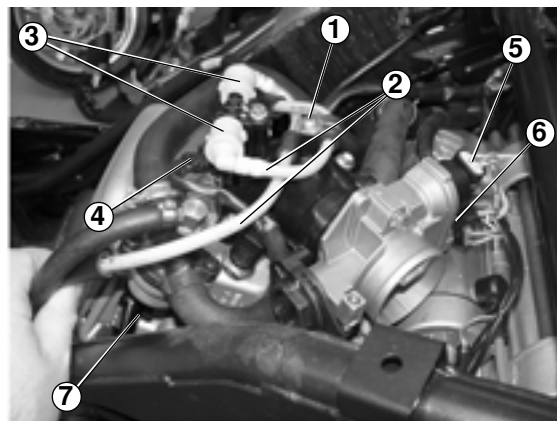
Read carefully (PRECAUTIONS AND GENERAL INFORMATION).

### ▲ CAUTION

**Stop the engine and wait until the engine and exhaust system have cooled down.  
Disconnect the battery.**

Bleed the cooling system completely (see REPLACING THE COOLANT).

Remove the left- and right-hand inspection covers, see (REMOVING THE LEFT AND RIGHT INSPECTION COVERS).

**3**

### ▲ CAUTION

**Use a degreasing detergent, brushes and cloths to clean the outer parts of the engine.  
Rubber or plastic parts must not be damaged by penetrating or corrosive detergents or solvents.**

**If you use a steam cleaner, do not direct high-pressure streams of water, air, or steam directly at the wheel hubs, the right and left handlebar controls, brake pump, the instruments and gauges, the exhaust outlet, glove compartment or the ignition switch / steering lock.**

Clean the engine and connected components.

### ▲ CAUTION

**Mark all cables, hoses, pipes, etc. to avoid getting them mixed up when refitting.  
During reassembly, be sure to insert the parts correctly.**

Unscrew and remove the screw (1) that fastens the fuel injector supply tube support (2).

Disconnect the two connections (3) that supply gasoline to the fuel injector.

Disconnect the electric connection of the fuel injector (4).

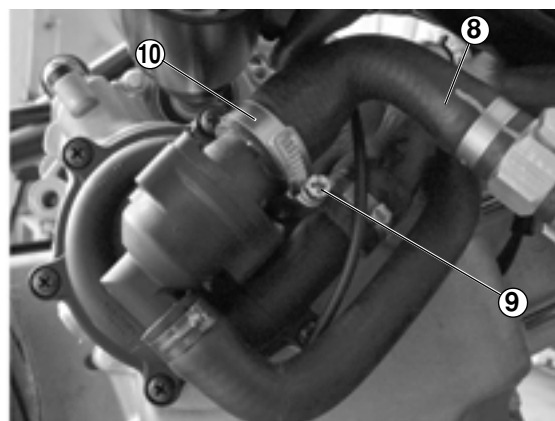
Disconnect the electric connection (5) of the automatic starter.

Disconnect the electric connection (6) of the throttle position sensor on the throttle unit.

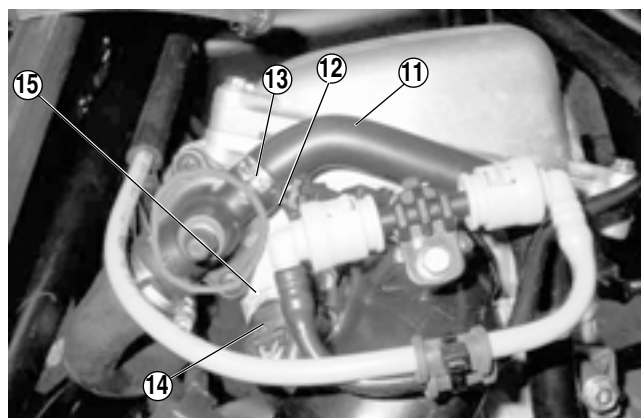
Slide out the spark plug (7) and free its cable from any couplings.

Disconnect the electric connection of the throttle unit air temperature sensor.

Disconnect the pump water inlet hose (8) by loosening the screw (9) of the hose clamp (10).

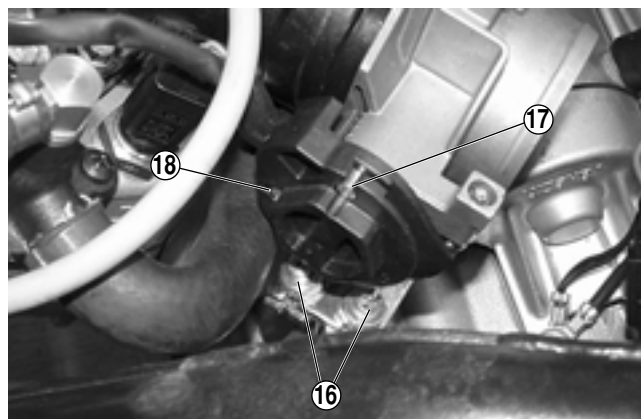


Disconnect the water outlet hose (11) from the cylinder by loosening the screw (12) of the hose clamp (13) on the coupling above the cylinder.



Disconnect the electric connection (14) of the coolant temperature sensor (15).

Loosen the two nuts (16) that fix the cable ducts to the throttle unit support.  
Slide out the cable duct and relevant outward barrel (17) on the throttle unit control.  
Slide out the cable duct and relevant return barrel (18) on the throttle unit control.

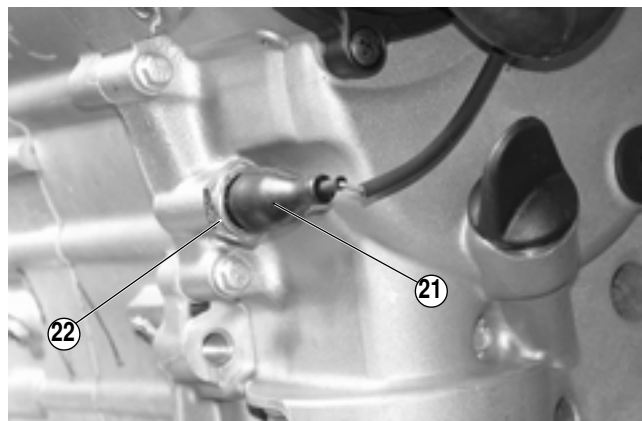


Disconnect the electric connection (19) of the stroke sensor (20) and free the cables from the clamps that fix them to the frame.





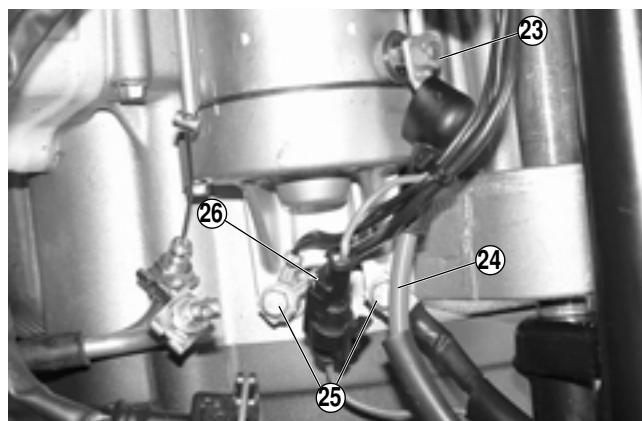
Slide out the rubber protection (21) and disconnect the connector of the engine oil pressure sensor (22).



Unscrew and remove the starter relay cable fastening nut (23) and slide out the cable (24).

Unscrew and remove the two screws (25) that fix the starter motor to the casing and free the relevant grounding cables.

Disconnect the connector (26) of the fuel injection positive cable.



#### ⚠ WARNING

The following operations require the assistance of a second operator, because of the weight and size of the components and motorcycle.

Agree beforehand on how to divide up the tasks (the tasks are marked as follows: those marked “A” are to be done by the first operator and those marked “B” by the second operator), the procedure to follow. This procedure is designed to ensure the safety of both mechanics.

**PROCEED WITH GREAT CARE.**

#### ⚠ WARNING

The size and weight of the motorcycle may cause it to tilt dangerously during the lifting, with the possibility of the whole motorcycle tipping over.

**PROCEED WITH CARE AND MAKE SURE YOU ARE ABLE TO BEAR THE WEIGHT OF THE MOTORCYCLE.**

Remove the rear wheel, see (REMOVING THE REAR WHEEL).

“A” Grip the frame, lift the rear part of the vehicle and maintain it in this position, using belts if required.



“A” Prepare suitable supports to place under the engine after it has been removed from the frame.  
“B” Unscrew and remove the fastening pin (27) of the left rear suspension (28).  
Retrieve the relevant nut and washer.

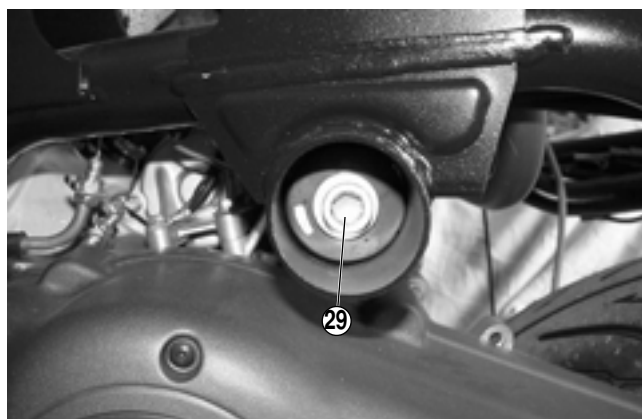
**⚠ CAUTION**

**Due to the heavy weight of the engine, work with caution and beware of hand injuries.**

“A” Accompany the engine until it is resting on the ground.



“B” Unscrew and remove the left pin (29) that fixes the engine to the frame and retrieve the washer.  
“A” Support the left-hand side of the engine.



“B” Unscrew and remove the right pin (30) that fixes the engine to the frame and retrieve the washer.

**⚠ CAUTION**

**Proceed with care.  
Beware of finger and limb injuries.  
Take care when lifting and moving the motorcycle**



“A” and “B” Lower the complete engine and place it on a workbench.

**⚠ CAUTION**

**Block the exhaust and intake manifold of the engine inlet manifold to stop any impurities or foreign bodies getting into it.**

**Fuel system**

**4**

## FUEL PUMP AND TANK

### EMS FUEL INJECTION SYSTEM

This fuel injection system has integrated injection and ignition.

Injection is indirect into the manifold, using an electronic fuel injector.

Injection and ignition are phased to a 4-stroke cycle, using a phonic wheel dropped on the camshaft control and a reluctance variation sensor.

Carburation and ignition are both controlled according to engine revs and gas valve opening.

Further corrections are made according to the following parameters:

- Coolant temperature
- Intake air temperature
- Ambient pressure

The system corrects the idling supply with a cold engine using a stepper motor, which is inserted into a by-pass circuit of the gas valve. The control unit controls the stepper motor and the fuel injector opening time, thus guaranteeing idling stability and correct carburation.

Carburation is controlled in all operating conditions by modifying the opening time of the fuel injector.

Fuel supply pressure is kept constant according to ambient pressure.

The **supply circuit** is comprised of:

- Fuel pump
- Fuel filter
- Fuel Injector
- Pressure regulator

The pump, filter and regulator are inserted into the fuel tank on a single support.

The fuel injector is connected by two pipes with snap-on couplings. This forms a continual circuit that prevents the risk of fuel boiling. The pressure regulator is located at the end of the circuit.

The fuel pump is controlled by the EMS control unit; this guarantees vehicle safety.

The **ignition circuit** is comprised of:

- High tension coil
- High tension cable
- Shielded cap
- EMS control unit
- Spark plug

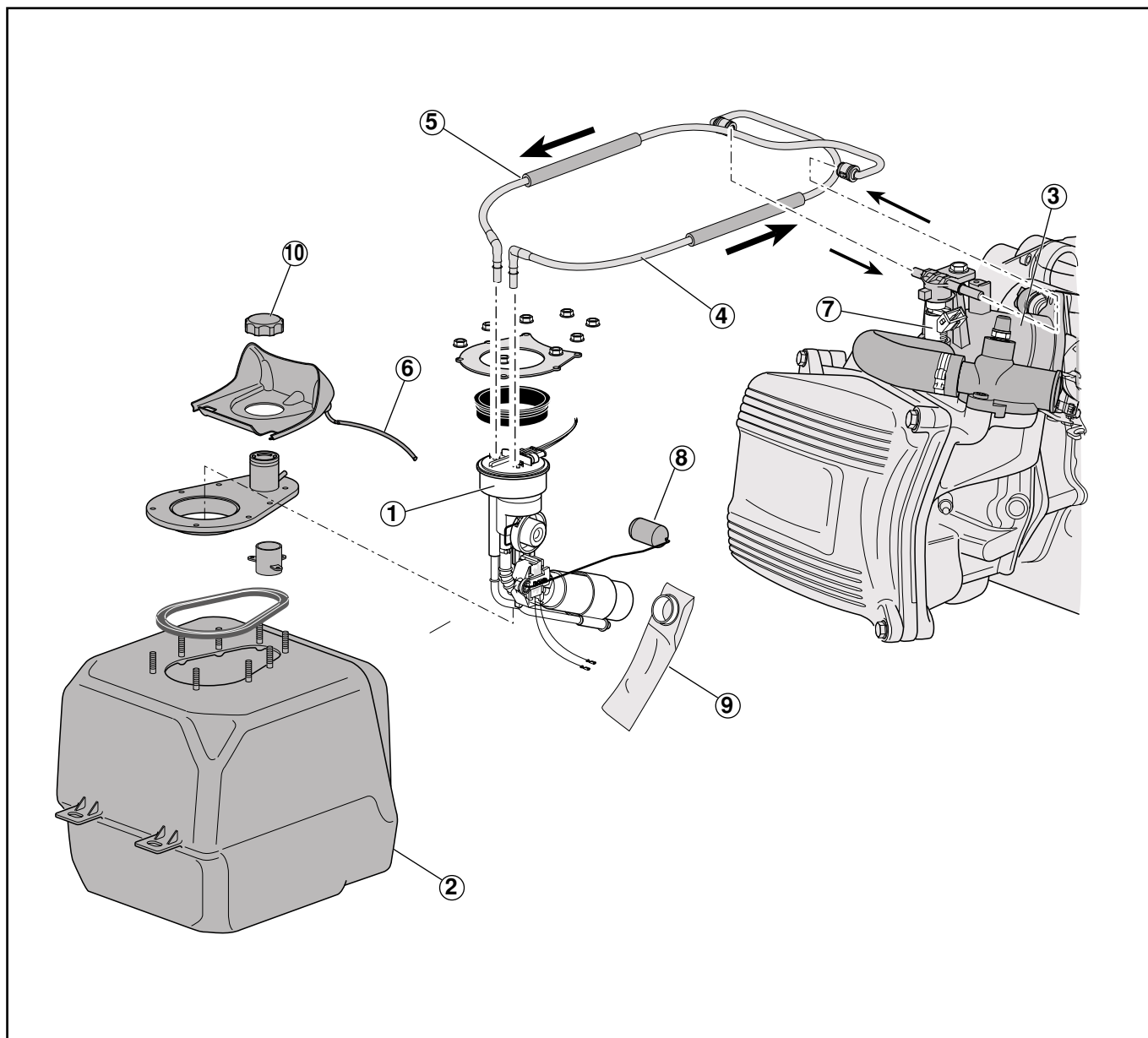
The EMS control unit controls the ignition with optimum spark lead and at the same time, guarantees the timing of the 4-stroke cycle (ignition only during the compression stage).

The EMS fuel injection-ignition system controls engine operations by means of a pre-set program.

In the event that any input signals are lacking, acceptable engine operation is in any case guaranteed in order to allow the user to reach the repairs workshop.

Of course, this is not possible when the stroke-revs signal is lacking or when a malfunction occurs within the control circuits:

- Fuel pump
- High tension coil
- Fuel injector

**FUEL SUPPLY SYSTEM**

**FUEL SUPPLY SYSTEM KEY**

- 1) Fuel pump
- 2) Fuel tank
- 3) Intake manifold
- 4) Fuel supply pipe (DELIVERY)
- 5) Fuel supply pipe (RETURN)
- 6) Excess gasoline bleeder pipe
- 7) Fuel injector
- 8) Fuel level float
- 9) Fuel pump filter
- 10) Filler cap

## MAINTENANCE

Check the condition of the tubing in the fuel system every 3,750 mi (6,000 km) or 8 months.  
Any pipes that show signs of drying, cracking or cuts must be replaced.  
Make sure that pipes are NOT twisted or choked.

### CHECKING THE FUEL SUPPLY SYSTEM

Read carefully (PRECAUTIONS AND GENERAL INFORMATION) and (FUEL).

#### ▲ CAUTION

**Fuel vapors are dangerous to health.**  
**Before proceeding, make sure that the place of work is sufficiently ventilated. Do not inhale fuel vapors.**  
**Avoid fuel contact with skin.**  
**Do not smoke or use naked flames.**  
**Dispose of fuel correctly.**

Position the vehicle on the center stand.  
Check that there is fuel in the tank.  
Remove the central tunnel, see (REMOVING THE CENTRAL TUNNEL).  
Place a container with a capacity of approx. 0.264 gallons (1 ℓ) alongside the vehicle. This is to recover fuel.

#### ▲ CAUTION

**Work with caution. Collect the fuel that comes out of the fuel supply pipe (RETURN).**







Disconnect the fuel supply pipe (RETURN) from the fuel pump (5) (see FUEL SUPPLY SYSTEM drawing).  
Place the free end of the pipe into the container.  
Set the ignition switch to "○".  
Without accelerating, run the starter motor for a few seconds and at the same time, check that the fuel flows out of the pipe (4).

If the fuel flow is discontinuous, or there is no flow, check the integrity and efficiency of the following parts:

#### ▲ CAUTION

**DO NOT INVERT THE PIPES WHEN REFITTING.**  
**Mark the pipes and relevant couplings in order to refit them correctly.**

Make sure that pipes are NOT twisted or choked.

To carry out checks, see the ENGINE WORKSHOP MANUALS n°1063 , n°1064 , n°1065 , n°1066 , n°1067  and n°1068 .

## REMOVING/DISASSEMBLING THE FUEL PUMP

Read carefully (PRECAUTIONS AND GENERAL INFORMATION) and (FUEL).

### REMOVING THE PUMP ASSEMBLY

#### ▲ CAUTION

Fuel vapors are dangerous to health.  
Before proceeding, make sure that the place of work is sufficiently ventilated.  
Do not inhale fuel vapors.  
Avoid fuel contact with skin.  
Do not smoke or use naked flames.  
Dispose of fuel correctly.

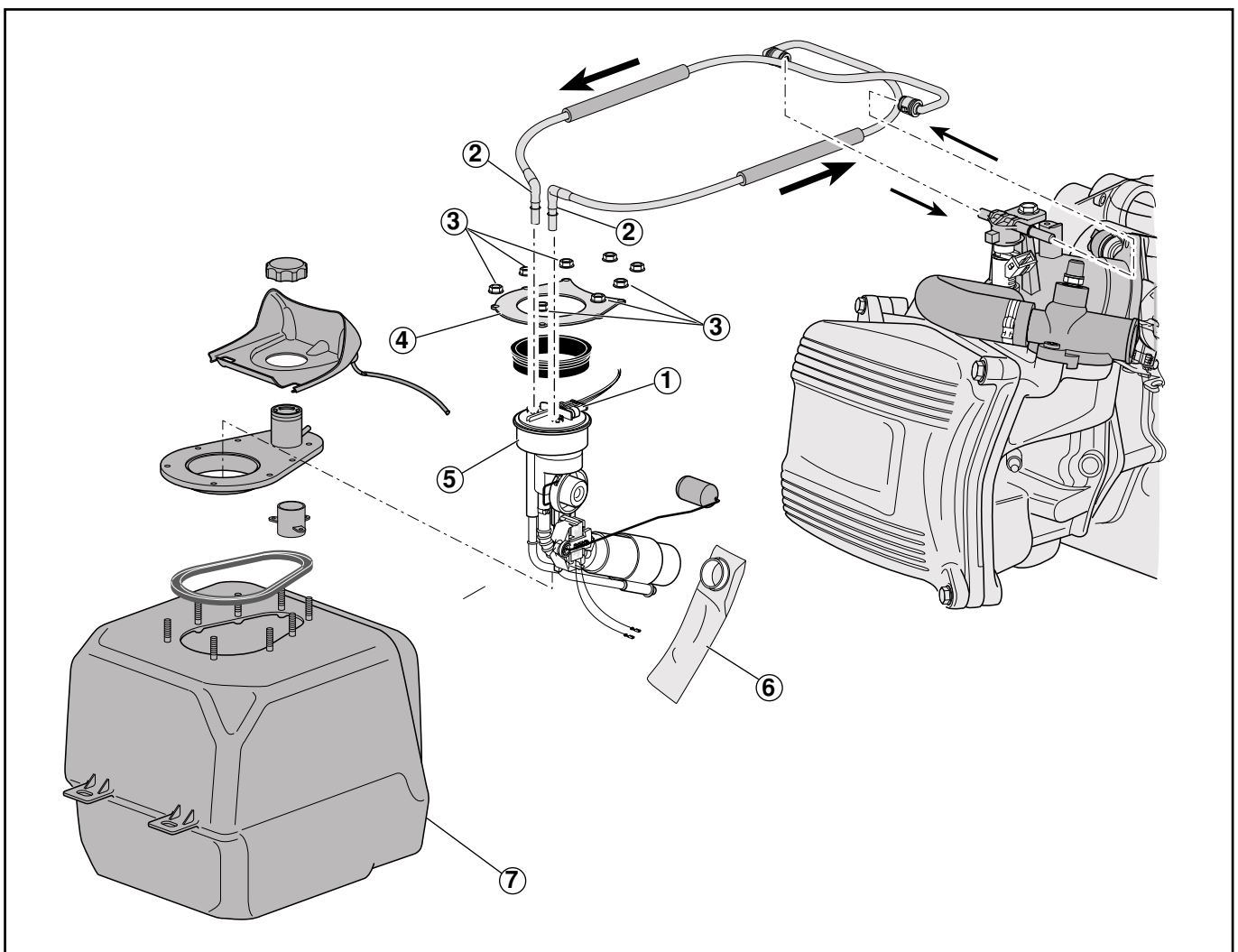
Remove the central tunnel, see (REMOVING THE CENTRAL TUNNEL).  
Disconnect the electric connection (1) that controls the fuel pump.  
Disconnect the fuel supply pipes (2) from the body of the fuel pump.  
Unscrew and remove the six nuts (3).  
Remove the fuel pump fastening bracket (4).

#### ▲ CAUTION

Work with caution when removing the fuel pump (5), taking care not to damage the fuel pre-filter (6).

Remove the fuel pump (5) from the tank (7).

4

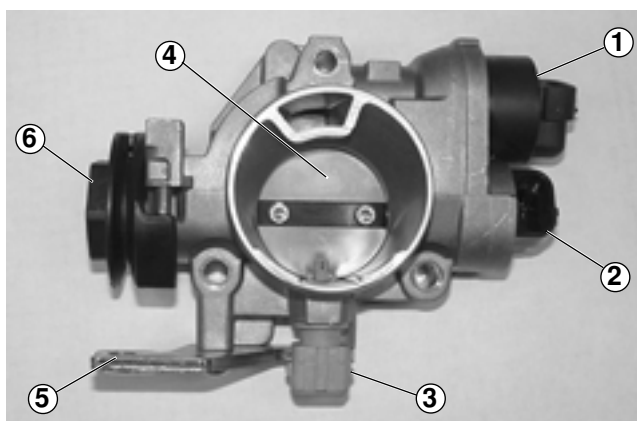


## DISASSEMBLING AND CHECKING THE PUMP AND FUEL LEVEL PROBE

To disassemble these parts, see the ENGINE WORKSHOP MANUALS n°1063 **I**, n°1064 **E**, n°1065 **F**, n°1066 **D**, n°1067 **UK** and n°1068 **USA**.

## THROTTLE UNIT

- 1) Stepper motor
- 2) Throttle position sensor
- 3) Air temperature sensor
- 4) Valve
- 5) Valve opening cable support plate
- 6) Valve opening/closing wiring control guide

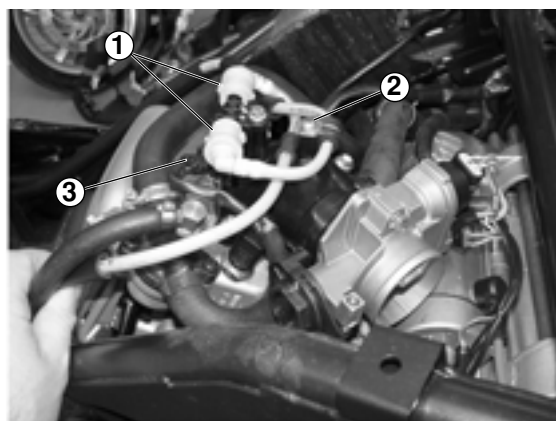


## REMOVING THE THROTTLE UNIT

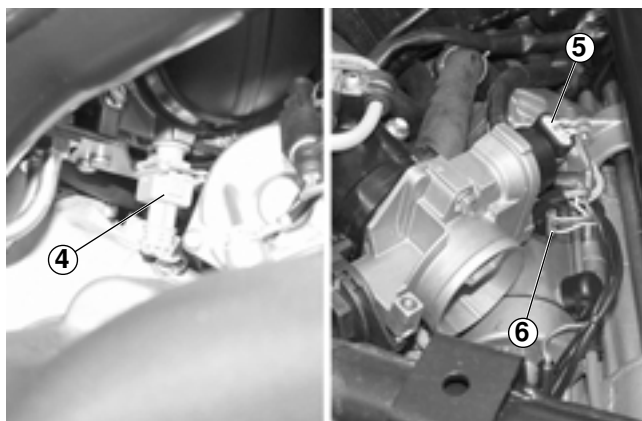
Read carefully (PRECAUTIONS AND GENERAL INFORMATION) and (FUEL).

Remove the air filter box, see (AIR FILTER).

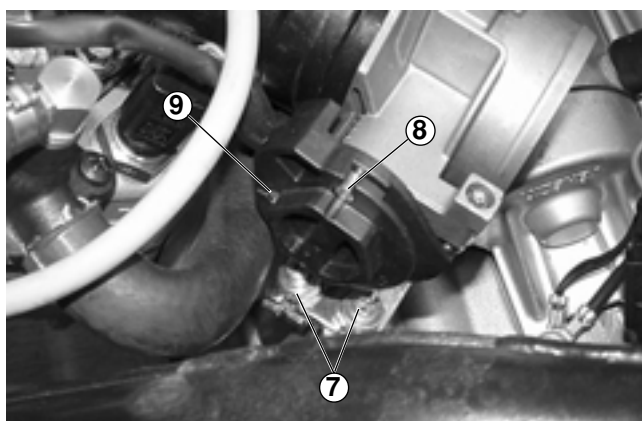
Disconnect the delivery and return fuel supply pipes (1) of the fuel injector.  
Unscrew and remove the screw (2) that fastens the fuel pipe guide fasteners.  
Disconnect the electric connection (3) of the fuel injector control.



Disconnect the electric connection (4) of the air temperature sensor.  
Disconnect the electric connection (5) of the stepper motor.  
Disconnect the electric connection (6) of the throttle position sensor.

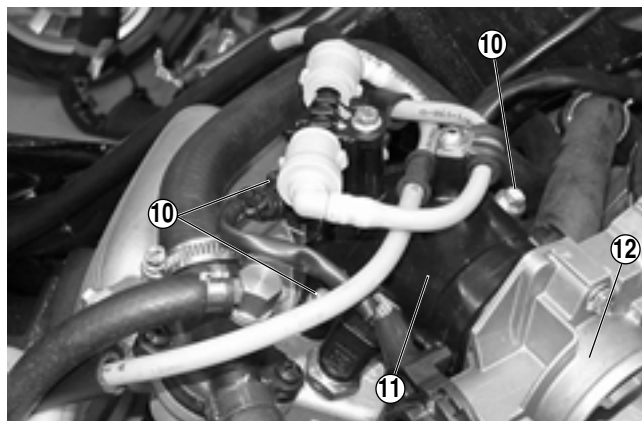


Loosen the two nuts (7) that fix the cable guides to the carburetor support.  
Slide out the cable guide and relevant outward barrel (8) on the carburetor control.  
Slide out the cable guide and relevant return barrel (9) on the carburetor control.

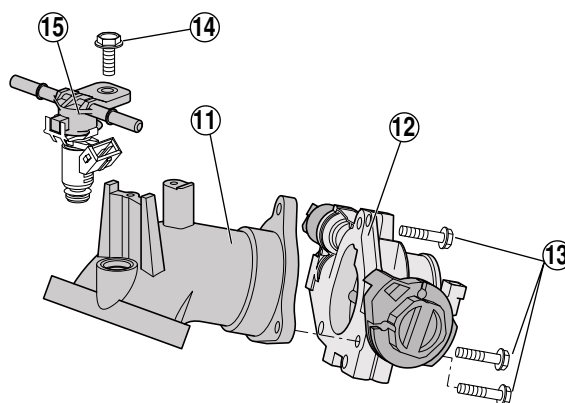




Unscrew and remove the three screws (10) that fasten the intake manifold (11) to the head.  
Remove the intake manifold (11) and throttle unit (12).



Unscrew and remove the three screws (13) that fasten the throttle unit (12) to the intake manifold (11).  
Remove the throttle unit (12) from the intake manifold (11).  
Unscrew and remove the screw (14) that fastens the fuel injector (15) to the intake manifold.  
Remove the fuel injector (15) from the intake manifold (11).





## SYSTEM DESCRIPTION

The cooling system is comprised of a centrifugal pump that is coaxial to the countershaft and for this reason, it makes the same number of revolutions as the engine shaft.

The pump has two intake pipes and one outlet pipe.

The outlet feeds the cylinder and as a result, the head; one intake comes from the head and is controlled at the pump intake by the thermostat cap.

The main seal of the thermostat operates on the main intake pipe of the pump, which comes from the radiator.

The radiator is supplied by the head outlet; the expansion tank is parallel to the radiator with pipes on two levels: delivery on top (in air) and fluid return at the bottom (in the fluid).

The system is of the two-way type.

The first path is formed by circulation inside the engine and involves the pump, cylinder and head; this type of circulation is completely enabled when the thermostat is fully closed.

The second path is enabled when the thermostat is fully open and is the main circulation, involving pump, cylinder, head, radiator, and expansion tank. For medium thermostat openings, both circuits are partially enabled and therefore, the two paths overlap.

This type of circuit is defined as having an intake thermostat. The thermostat is crossed by an inverse flow; that is, with cold water, which tends to lower the temperature of the wax cell.







This system allows optimization of the heating stages of the engine.

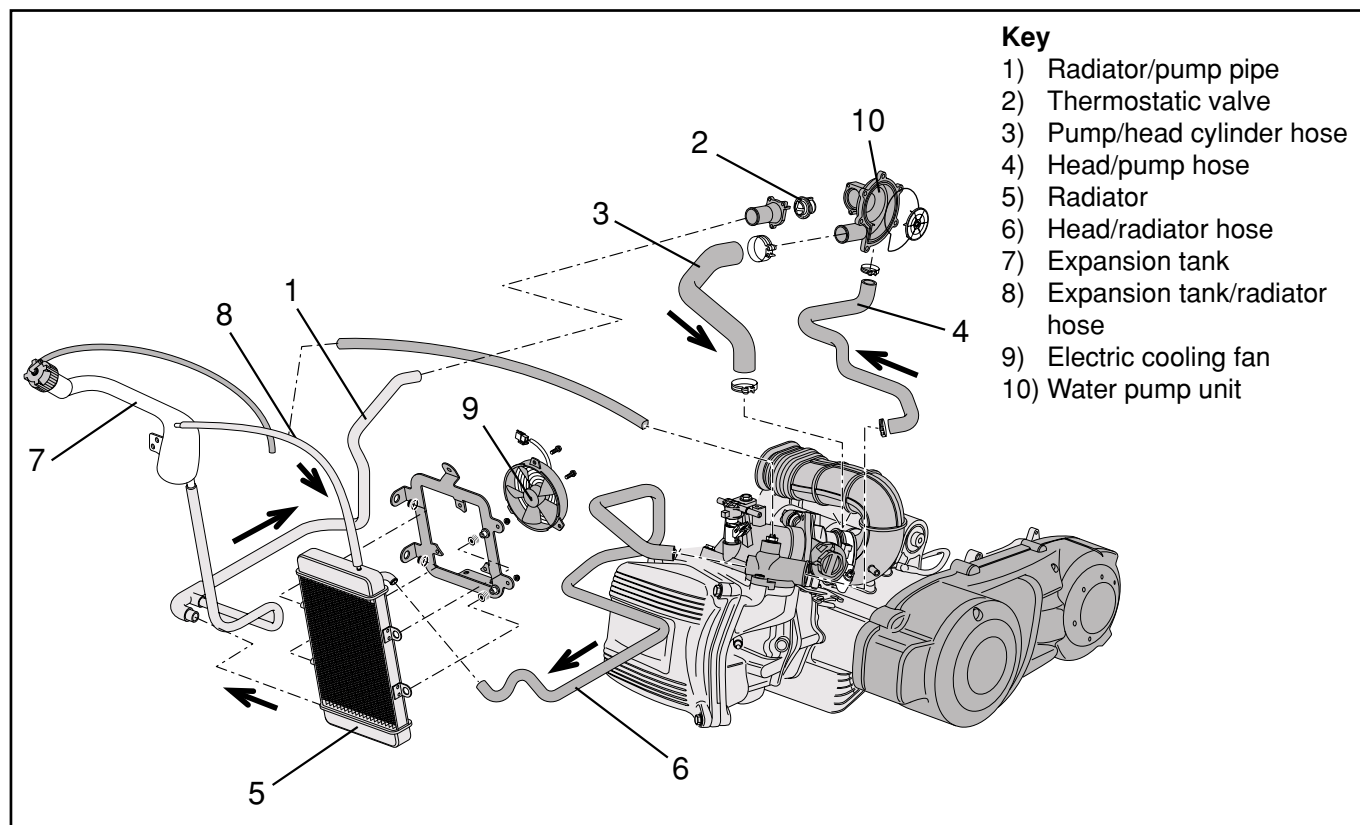
The expansion tank, which is parallel to the radiator and inserted into the main circuit, guarantees autobleeding during operation.

For the system filling stages, there is a bleeder at the head outlet (see filling regulations).

The electric cooling fan is controlled by the fuel injection system and the relevant temperature is measured on the engine head.







## COOLANT

For information about the coolant, see (COOLANT), (CHECKING AND TOPPING UP COOLANT) and (REPLACING COOLANT) in the relevant ENGINE WORKSHOP MANUALS n°1063 , n°1064 , n°1065 , n°1066 , n°1067  and n°1068 .



## REMOVING THE RADIATOR

Read carefully (COOLANT) and (PRECAUTIONS AND GENERAL INFORMATION).

Empty the coolant completely, see (REPLACING COOLANT), in the ENGINE WORKSHOP MANUALS n°1063 , n°1064 , n°1065 , n°1066 , n°1067  and n°1068 .

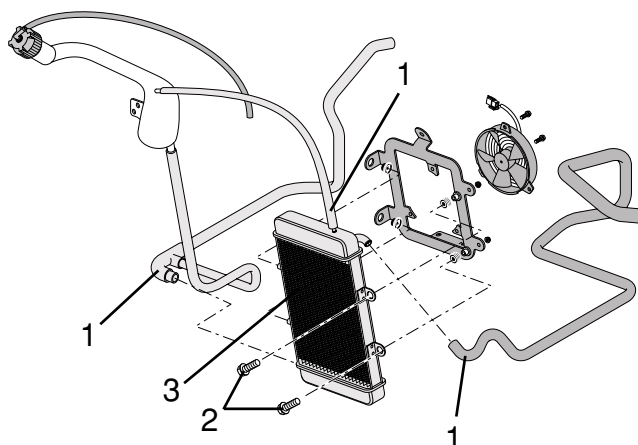
Remove the leg shield, see (REMOVING THE LEG SHIELD).

Remove the front splash guard, see (REMOVING THE SPLASH GUARD).

Remove the heat-reflecting material.

Disconnect the three hoses (1) on the radiator.

Unscrew and remove two radiator fastening screws (2).



### CAUTION

**Proceed with care.**

**Do not damage the radiator fins.**

Remove the radiator (3) turning it slightly clockwise and pulling towards the left side of the vehicle.

## REMOVING THE ELECTRIC COOLING FAN

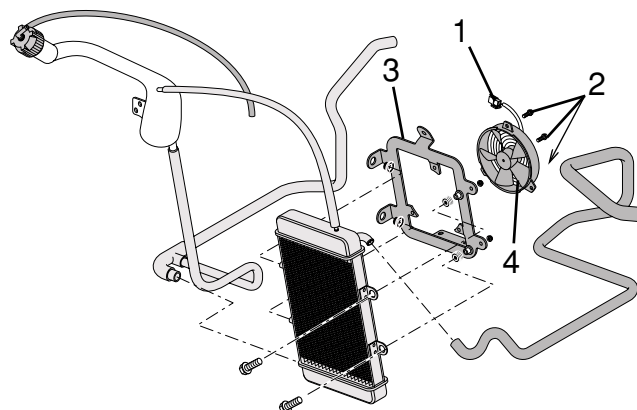
Read carefully (PRECAUTIONS AND GENERAL INFORMATION).

Remove the radiator, see (REMOVING THE RADIATOR).

Disconnect the electric connection (1) of the electric cooling fan.

Unscrew and remove the three screws (2) that fasten the electric fan to its support (3).

Remove the electric cooling fan (4).



## REMOVING THE EXPANSION TANK

Read carefully (COOLANT) and (PRECAUTIONS AND GENERAL INFORMATION).

Position the motorcycle on the center stand.  
Remove the front outer shield, see (REMOVING THE FRONT OUTER SHIELD).  
Remove the leg shield, see (REMOVING THE LEG SHIELD).  
Remove the dashboard, see (REMOVING THE DASHBOARD).

### ▲ CAUTION

**DO NOT DISPOSE OF COOLANT IN THE ENVIRONMENT.**

When the hose (1) is disconnected, the coolant contained in the expansion tank (2) will run out. Put a container of approximate capacity 1 liter in position to catch the fluid as it comes out. Place an absorbent cloth under the expansion tank to catch any coolant that spills out.

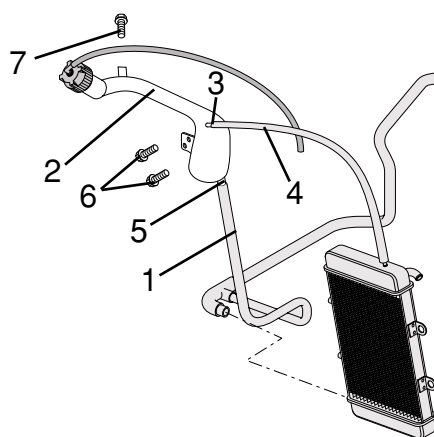
**NOTE** Prepare screwdriver-type worm clamps to replace the original clamps (special type without screws).

Remove the clamp (3).  
Replace with a new clamp when reassembling.  
Slide the sleeve (4) out from the expansion tank coupling.  
Remove the clamp (5).  
Replace with a new clamp when reassembling.  
Slide the sleeve (1) out from the expansion tank coupling.  
Quickly place a container under the expansion tank and recover the coolant.







### ▲ CAUTION

**Coolant is harmful.  
Keep the container in a safe place.  
KEEP OUT OF REACH OF CHILDREN.**







Unscrew and remove the two screws (6) and the screw (7).  
Remove the expansion tank.









## THERMOSTAT VALVE

For information on the thermostat valve, see ENGINE WORKSHOP MANUAL n°1063 , n°1064 , n°1065 , n°1066 , n°1067  and n°1068 .

## COOLANT PUMP

For information on the coolant pump, see ENGINE WORKSHOP MANUAL n°1063 , n°1064 , n°1065 , n°1066 , n°1067  and n°1068 .

## COOLANT THERMISTOR

For more information about the coolant thermistor, see ENGINE WORKSHOP MANUALS n°1063 , n°1064 , n°1065 , n°1066 , n°1067  and n°1068 .



**Electrical system**

**6**

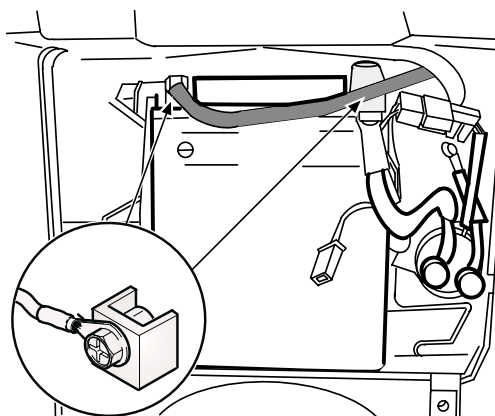


## CHECKING THE RECHARGE SYSTEM

Refer to the following key when consulting this section.

### CABLE COLOURS

<b>Ar</b>	orange
<b>Az</b>	light blue
<b>B</b>	blue
<b>Bi</b>	white
<b>G</b>	yellow
<b>Gr</b>	grey
<b>M</b>	brown
<b>N</b>	black
<b>R</b>	red
<b>V</b>	green
<b>Vi</b>	violet
<b>Ro</b>	pink



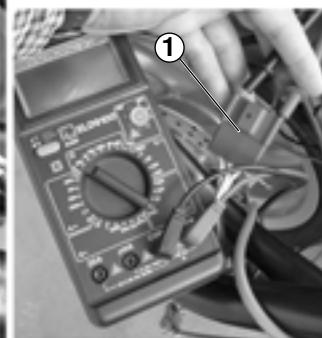
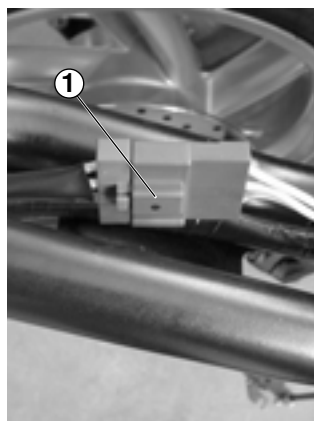
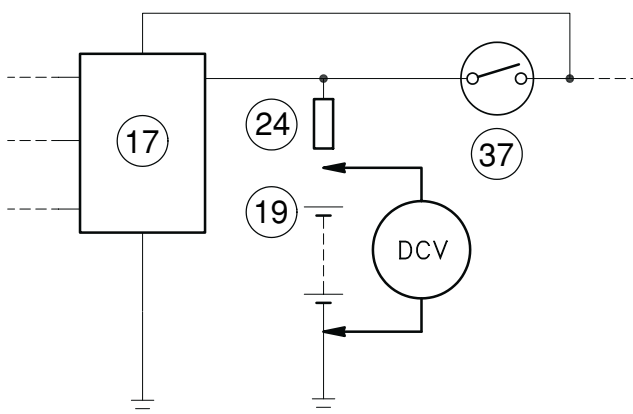
### CHECKING THE RECHARGE VOLTAGE

- Check the electrolyte level (see CHECKING THE ELECTROLYTE LEVEL).
- Check the battery voltage (see RECHARGING THE BATTERY).
- Start the engine and take it to 5,000 rpm (throttle control turned approximately 1/4 of its range).
- Switch the light switch to the "☉" position and the light selector to the "☞" position.
- Using a portable tester, check the continuous voltage between the battery positive (+) and negative (-) terminals.
- If the tester reading is less than 13 V or greater than 15 V:
- Check the function and continuity of the alternator without load, see (CHECKING THE ALTERNATOR WITHOUT LOAD) and (CHECKING THE ALTERNATOR CONTINUITY) and the voltage regulator, see (VOLTAGE REGULATOR).

#### Key to second figure

- 17) Voltage regulator
- 19) Battery
- 37) Ignition switch (right-hand dimmer)
- 24) Main fuse

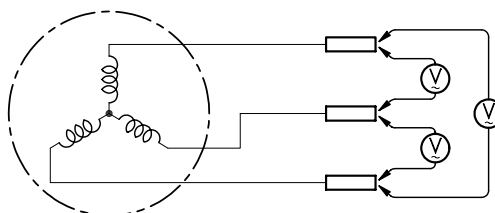
**Standard charge voltage: 13 to 15 V (d.c.) at 5,000 rpm.**



### CHECKING THE ALTERNATOR WITHOUT LOAD

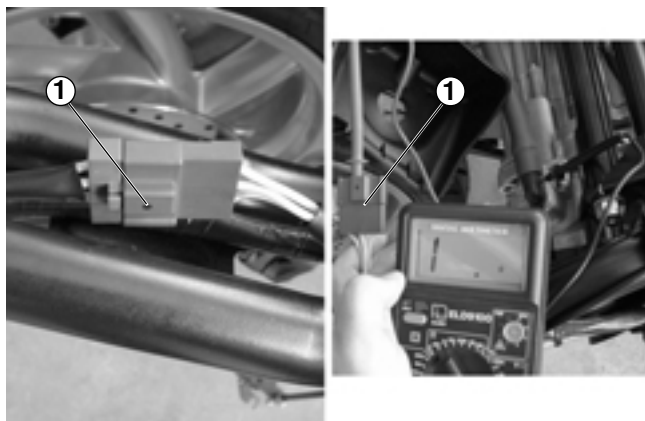
- Remove the right side panel, see (REMOVING THE SIDE PANELS).
- Disconnect the alternator wire connector (1).
- Start the engine and take it to 5,000 rpm (throttle control turned approximately 1/4 of its range).
- Using a portable tester, test the voltage (alternating current, a.c.) between the three yellow wires (G), testing them two at a time. If the tester reading is less than 50 V, the alternator is defective.

**Standard voltage without load: greater than 50 V (a.c.) at 5,000 rpm.**

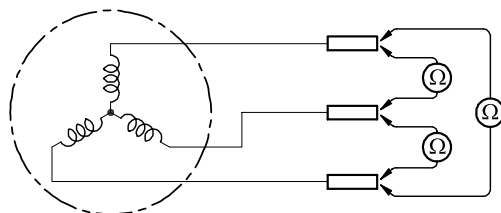


**CHECKING THE ALTERNATOR CONTINUITY****With the engine off:**

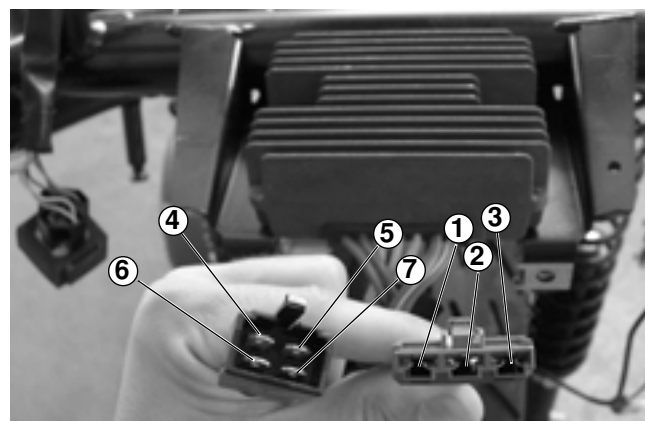
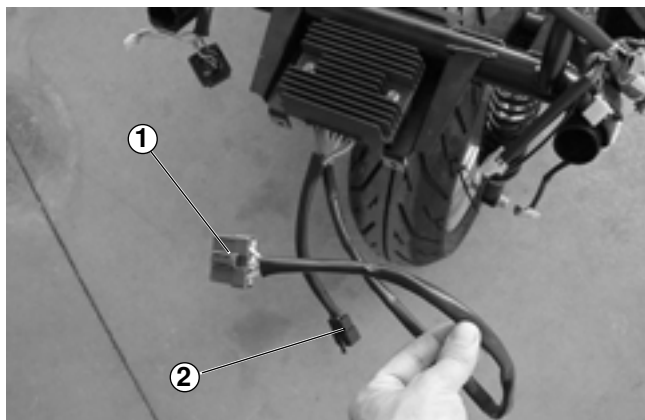
- Remove the right side panel, see (REMOVING THE SIDE PANELS).
- Disconnect the regulator wires connector (1).
- Using a portable tester, test the continuity between the yellow wires (G) of the stator.
- Also, check the isolation of the stator support.

**Standard resistance: 0.1 - 1  $\Omega$** **Standard resistance between wires and stator support:  $\infty$  (infinity)****VOLTAGE REGULATOR**

- Remove the rear part of the fairing, see (REMOVING THE REAR PART OF THE FAIRING).
- Remove the right side panel, see (REMOVING THE SIDE PANELS).
- Disconnect the connectors (1) and (2).
- Using a portable tester (scale x 1 k $\Omega$ ), test (from the regulator side) the resistance between the wires indicated in the table below.
- If the resistance reading is incorrect, change the regulator.

**6**

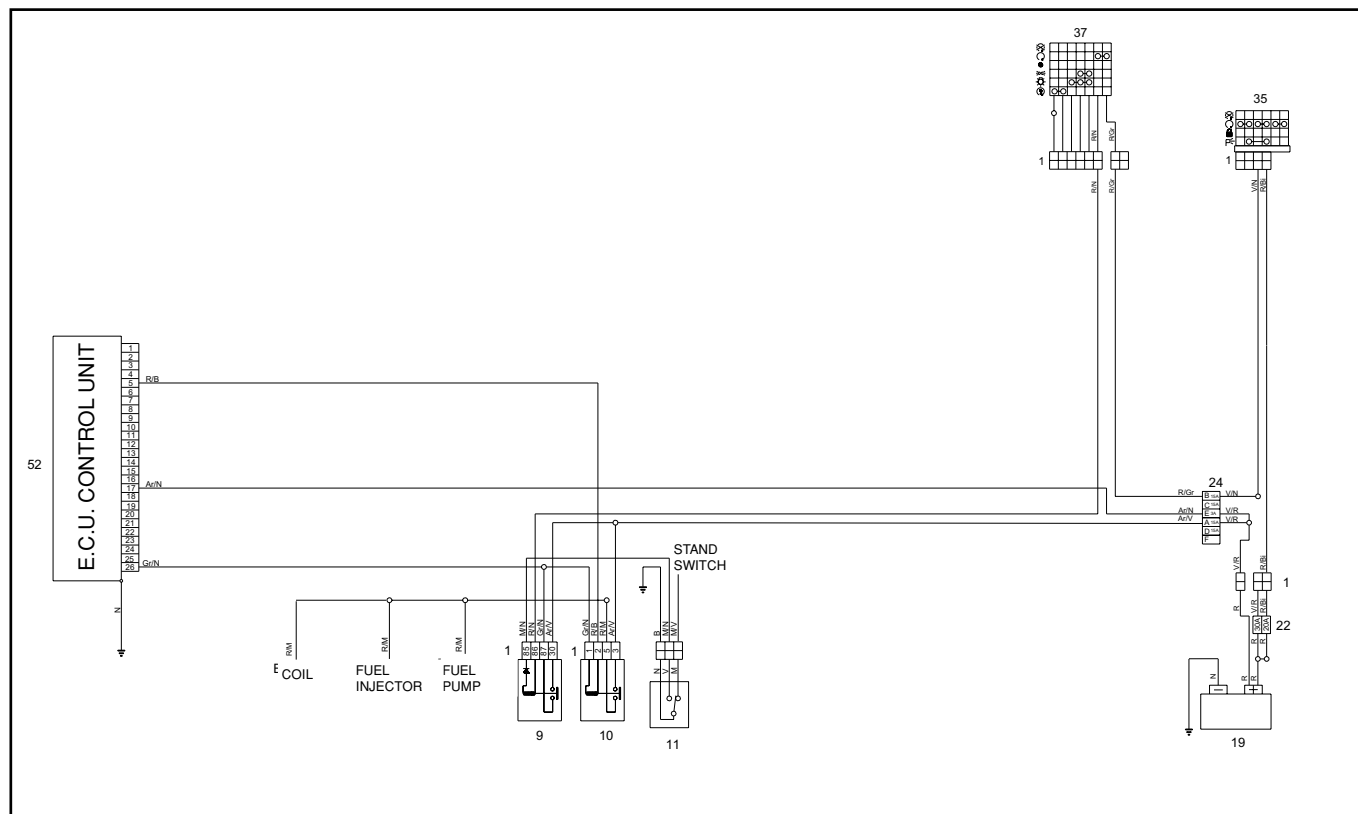
		Tester positive terminal (+) on:						
Tester negative terminal (-) on:		1	2	3	4	5	6	7
	1		$\infty$	$\infty$	$\infty$	$\infty$	$\infty$	$\infty$
	2	$\infty$		$\infty$	$\infty$	$\infty$	$\infty$	$\infty$
	3	$\infty$	$\infty$		$\infty$	$\infty$	$\infty$	$\infty$
	4	$\infty$	$\infty$	$\infty$		$\infty$	0	$\infty$
	5	$\infty$	$\infty$	$\infty$	$\infty$		$\infty$	0
	6	$\infty$	$\infty$	$\infty$	0	$\infty$		$\infty$
	7	$\infty$	$\infty$	$\infty$	$\infty$	0	$\infty$	

**⚠ CAUTION**

This inspection method is only approximate.  
If possible, substitute a voltage regulator that you know works, to check the charging circuit.

## IGNITION SYSTEM

### FUEL INJECTION SUPPLY WIRING DIAGRAM



#### Key

- 9) Main fuel injection relay
- 10) Secondary fuel injection relay
- 11) Side stand switch
- 19) Battery
- 35) Key commutator
- 37) Right-hand dimmer
- 52) E.C.U. control unit

**CHECKING THE STAND SWITCH**

The rotation of the side stand (1) must be free of any impediments.

Make the following checks:

- The springs (2) must not be damaged, worn, rusty or weakened.
- The stand must rotate freely; grease the joint if necessary, see (LUBRICANT CHART).

A safety switch (3) is fitted to the side stand (1) to prevent or interrupt engine operation when the side stand (1) is lowered.

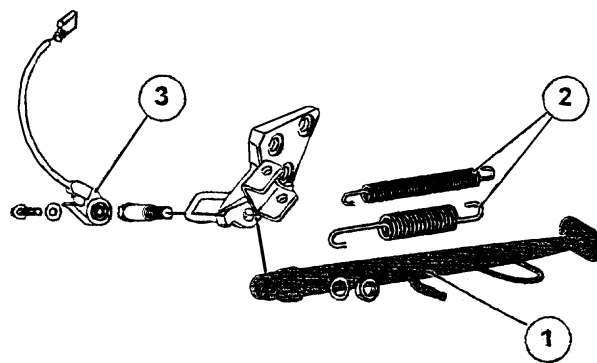
To check the working state of the safety switch (3), proceed as follows:

- Sit on the vehicle in the riding position.
- Bring up the side stand (1).
- Start the engine.
- Release the accelerator handle and idling the engine, lower the side stand (1), which will trigger the safety switch (3).

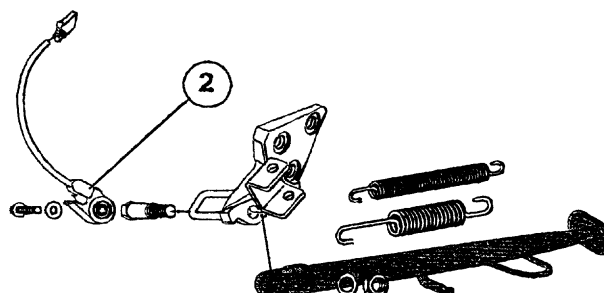
At this point:

- the engine must stop;
- the side stand down indicator "⚡" on the dashboard must switch on.

If this does not occur, replace the switch (3).

**STAND SWITCH**

Position	Wires		
	N	V	N
Down	○	—	○
Up		○	○



## CHECKING THE FUEL INJECTION RELAY

To check the working state of the relay switch, proceed as follows:

- Remove the rider's saddle, see (REMOVING THE RIDER'S SADDLE).
- Energize (12V) the two male terminals (85-86).
- Use a tester (as an ohmmeter) to check the continuity between the other two terminals (87-30).

**Correct value with relay energized: 0  $\Omega$**

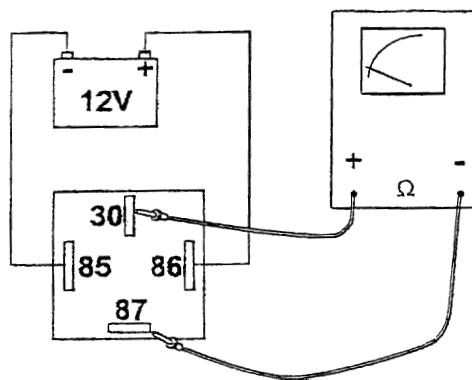
**Correct value with relay not energized:  $\infty$   $\Omega$**

If the values do not correspond to those given above, replace the relevant relay switch.

### ▲ CAUTION

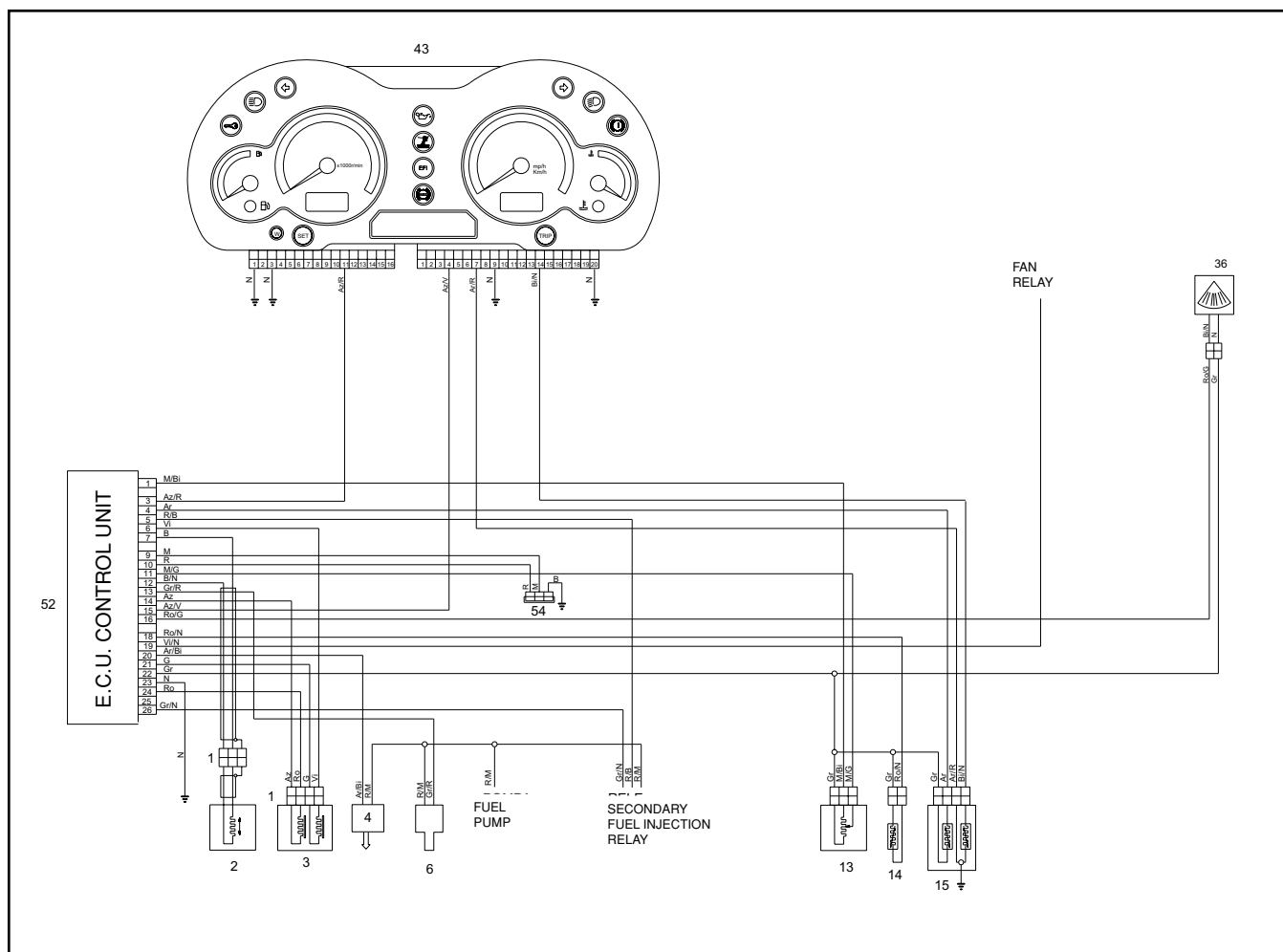
**For main fuel injection relay only:**

**Respect polarity, energizing the terminal (86) with “+” and the terminal (85) with “-”; a diode is present on the inside.**



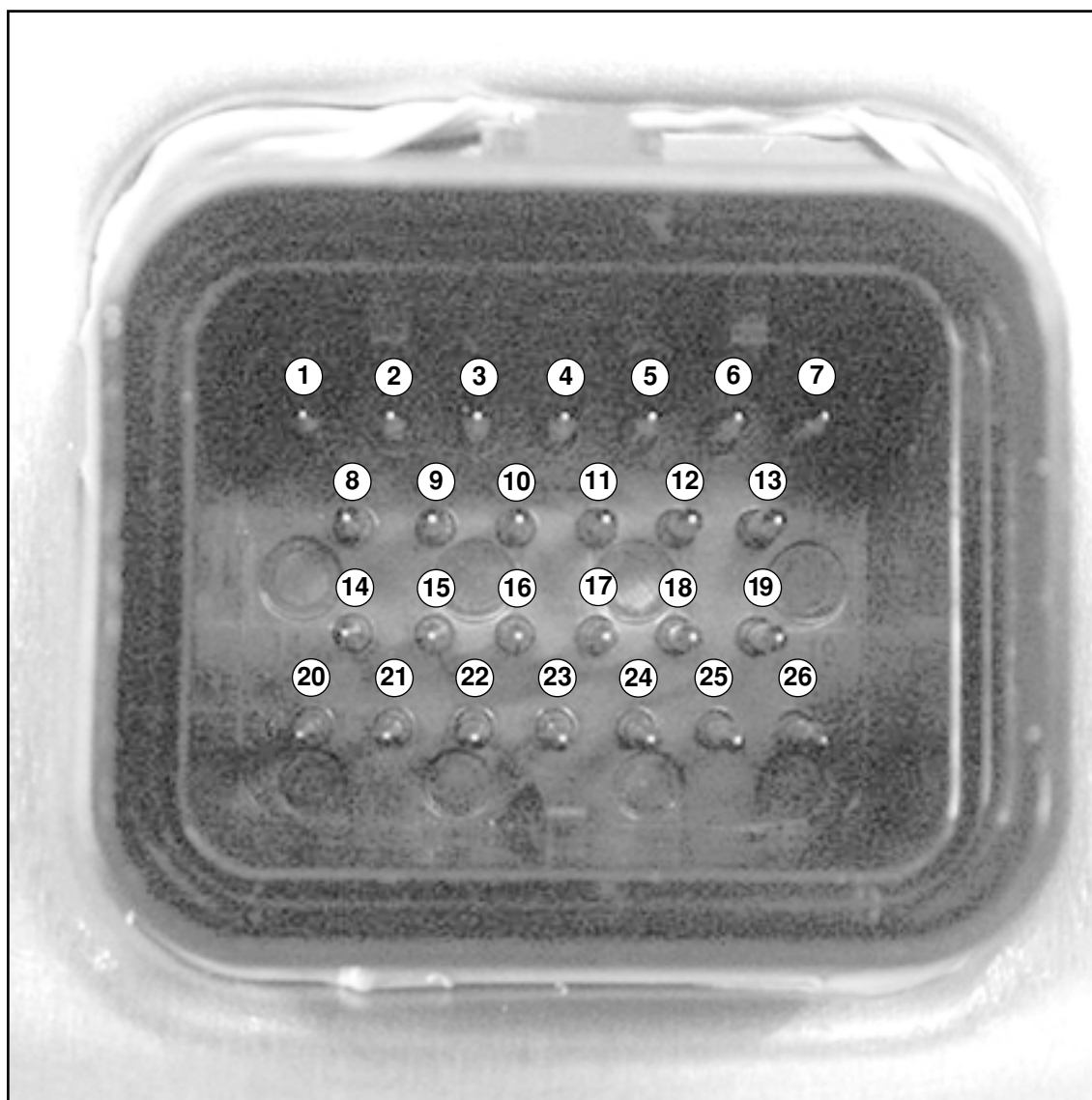
## IGNITION/FUEL INJECTION SYSTEM

### CONNECTIONS TO THE ELECTRONIC CONTROL UNIT



#### Key

- 2) Rev sensor
- 3) Stepper motor
- 4) Coil
- 6) Fuel injector
- 13) Accelerator sensor
- 14) Engine air thermistor
- 15) Engine water/dashboard thermistor
- 36) Drop sensor
- 43) Dashboard
- 52) E.C.U. control unit

**⚠ CAUTION**

Since there are diodes, condensers and other electrical components inside the C.D.I. control unit, the measuring method indicated is approximate.

We recommend carrying out another check by replacing the control unit with another perfectly operating unit, or by carrying out the checks listed in the chapter (CHECKING THE ELECTRICAL SYSTEM FROM THE C.D.I. CONTROL UNIT CONNECTOR).

## CONNECTIONS TO THE E.C.U. CONTROL UNIT

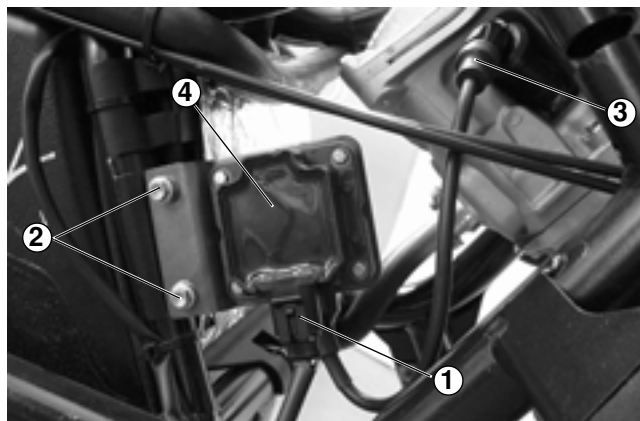
COMPONENT	TERMINAL	RATED VALUE	CABLE COLOURS
RPM Sensor	7 - 12	680 $\Omega$	B - B/N
Stepper Motor	14 - 24	52 $\Omega$	Az - Ro
Stepper Motor	6 - 21	52 $\Omega$	Vi - G
Accelerator Sensor	1 - 22	5 k $\Omega$	M/Bi - Gr
Accelerator Sensor	1 - 11	1 - 6 k $\Omega$	M/Bi - M/G
Fuel Inj. Air Terminal	18 - 22	see tab.	Ro/N - Gr
Fuel Inj. H <sub>2</sub> O Terminal	4 - 22	see tab.	Ar - Gr
Drop Sensor	16 -22	62 k $\Omega$ *	Ro/G - Gr
Coil	20	0.6 $\Omega$	Ar/Bi - R/M
Fuel Injector	13	14.5 $\Omega$	Gr/R - R/M

\* With drop sensor in the upright position.



### CHECKING THE HT COIL

- Remove the left side inspection cover (see REMOVING THE LEFT INSPECTION COVER).
- Disconnect the terminal (1).
- Unscrew and remove the two screws (2).
- Disconnect the spark plug cap (3).
- Remove the coil (4).

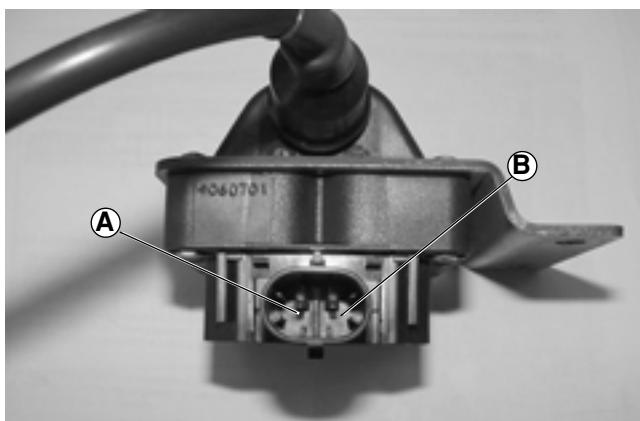


- Use a pocket tester (scale 200  $\Omega$ ) to measure the resistance (coil side) between the terminals shown in the figure (A and B).
- If the resistance is incorrect, replace the coil.

**Standard value: 0.6  $\Omega \pm 0.1 \Omega$**

- Also check the resistance between the high voltage terminal and the coil casing.

**Standard value: 7.4 k $\Omega$**



#### **⚠ CAUTION**

**Before measuring, remove the HT cable complete with spark plug cap.**

## CHECKING THE DROP SENSOR

**With the engine off:**

- Remove the front cover, see (REMOVING THE FRONT COVER).

Check that the sensor (1) is correctly fitted (with the arrow printed on the rubber element facing upwards).

- Partially remove the fuse block (2).
- Disconnect the two-way connector (3) (white/gray) and carry out the relevant measurements (on the sensor-side terminals).



### ⚠ CAUTION

**On reassembly, make sure that the electrical connector (3) is correctly coupled.**

- Use a tester (scale x 100 k $\Omega$ ) to measure the resistance between the terminals of the black and black/white cables (N - Bi/N).

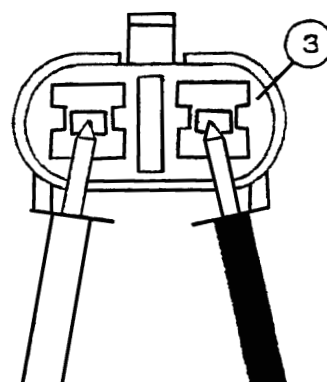
**Standard value: resistance 62 k $\Omega$   $\pm$  15%**

- Remove the sensor (1) and rubber element from its seat and incline it sideways by an angle greater than 45° (simulating a situation where the vehicle is lying on the ground).

**Standard value: 0 - 1  $\Omega$**

**If the resistance differs from the prescribed value, the sensor (1) must be replaced.**

- Repeat the operation, this time inclining the sensor from the opposite side.

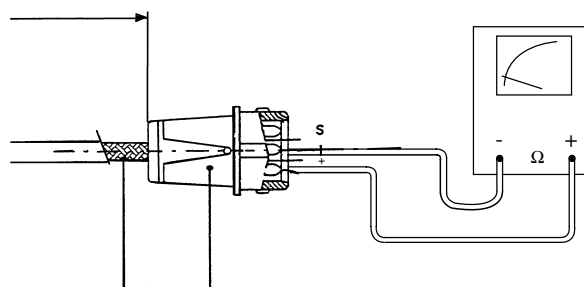
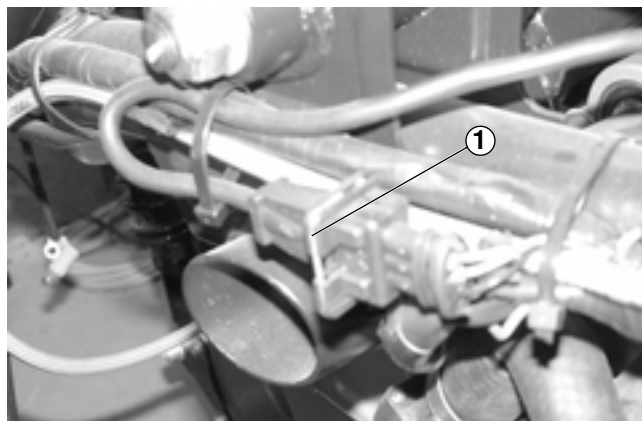


**CHECKING THE RPM SENSOR****With the engine off:**

- Disconnect the three-way connector (1) and carry out the relevant measurements.
- Use a tester (scale x 100  $\Omega$ ) to measure the resistance between the sensor terminals, respecting the relevant polarity (see figure).

**Standard value: 680  $\Omega \pm 10\%$**

- If the resistance is infinite or different from the prescribed value, the sensor must be replaced.



## CHECKING THE THROTTLE POTENTIOMETER (ACCELERATOR SENSOR)

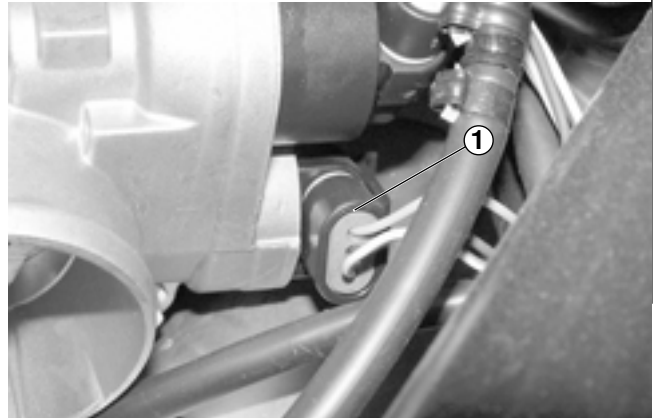
With the engine off:

- Disconnect the three-way sensor (black) (1).

### ▲ CAUTION

On reassembly, make sure that the electric connector (1) is correctly coupled.

- Set the ignition switch to "⊗".
- Use a tester (scale kΩ) to measure the resistance between the potentiometer terminals.



### READING (A)

Resistance between the two terminals, A and B, whatever the position of the throttle:

**Standard value: 5 kΩ ± 10%**

### READING (B)

Resistance between the terminals A and C:

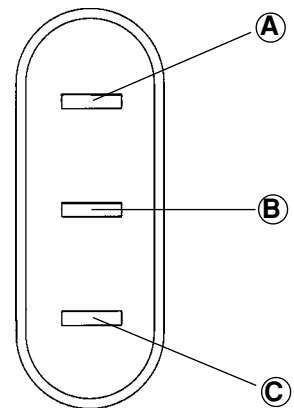
From the reading with the throttle completely closed, progressively accelerating until it is fully open, resistance will vary as follows:

**Standard value: from 1 kΩ - 6 kΩ ± 10%**

**NOTE** To make unscrewing the two screws easier, lock with LOCTITE® 243 and heat first with a jet of warm air.

- Unscrew and remove the screws.
- Remove the potentiometer.

If the resistance values are different from those prescribed, replace the potentiometer.



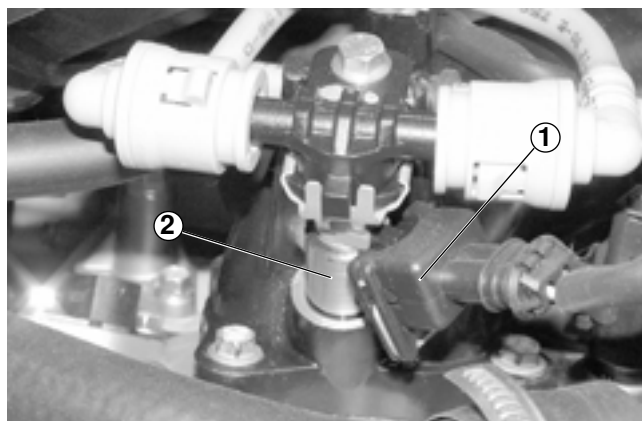
## CHECKING THE FUEL INJECTOR

### With the engine off:

- Disconnect the two-way connector (black) (1) and carry out the relevant measurements (on the injector-side terminals).
- Use a tester (scale  $\times 100 \Omega$ ) to measure the resistance between the fuel injector-side terminals.

**Standard value:  $14.5 \pm 10\% \Omega$  at  $45^\circ\text{F}$  ( $25^\circ\text{C}$ )**

**If resistance is infinite ( $\infty$ ) or lower than the prescribed value, the injector (2) must be replaced.**



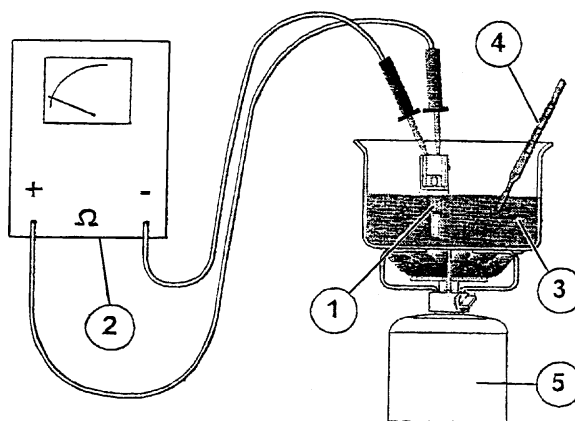
## CHECKING THE CONDITION OF THE COOLANT THERMISTOR

- Remove the thermistor (1), see (REMOVING THE COOLANT THERMISTOR).
- Connect a tester (2) (set as an ohmmeter) to the thermistor (1), as shown in the figure.
- Immerse the thermistor (1) in a container (3) filled with coolant.
- Immerse a thermometer (4) with a range of  $32\text{--}302^\circ\text{F}$  ( $0\text{--}150^\circ\text{C}$ ) in the same container.
- Place the container on a burner (5) and heat the coolant slowly.
- Check the temperature shown by the thermometer (4) and the value of the thermistor (1), as shown on the tester.

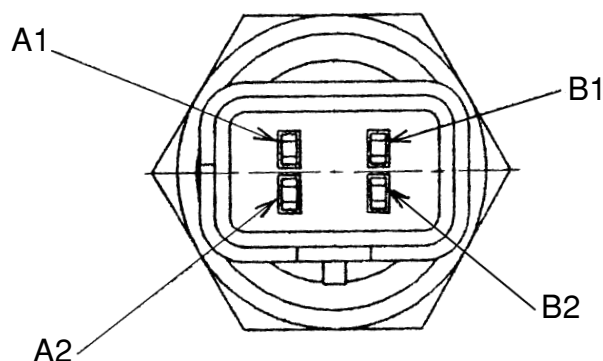
Make sure that the value varies according to temperature, as indicated.

**NOTE** If, as the temperature changes, the standard values do not change or are greatly different from the values shown in the table, replace the thermistor (1).

- Repeat these operations for the other thermistor.



Temperature $^\circ\text{F}$ ( $^\circ\text{C}$ )	A1 - A2 ( $\Omega$ )	B1 - B2 ( $\Omega$ )
140 (60)	$557 \pm 10\%$	$576 \pm 10\%$
194 (90)	$196 \pm 10\%$	$231 \pm 10\%$
248 (120)	$80.6 \pm 10\%$	$105 \pm 10\%$

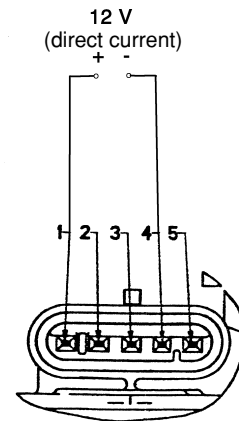


## CHECKING THE FUEL PUMP

- Energize terminals 1 and 4 of the pump connector with 12 V DC.
- Check that the pump operates, emitting its characteristic buzzing sound, and check that the supply pressure on the pressure gauge reaches at least 150 KPa (1.5 bars).

### ⚠ CAUTION

Respect pump polarity.



## CHECKING THE CONDITION OF THE AIR THERMISTOR

### ⚠ CAUTION

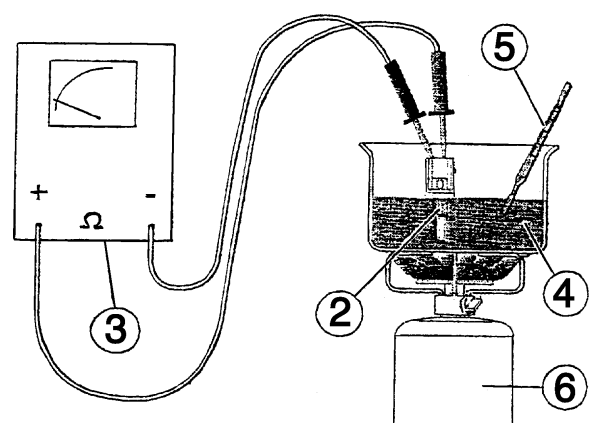
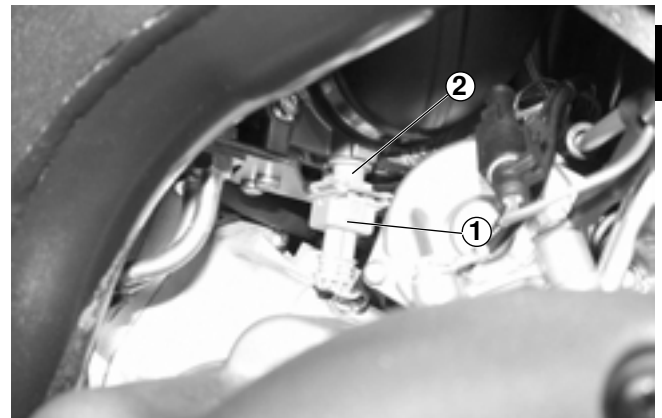
On reassembly, make sure that the electrical connector (1) is correctly coupled.

- Remove the thermistor (2).
- Connect a tester (3) (set as an ohmmeter) to the thermistor (2), as shown in the figure.
- Immerse the thermistor in a container (4) filled with water.
- Immerse a thermometer (5) with a range of 32-302°F (0-150°C) in the same container.
- Place the container on a burner (6) and heat the water slowly.
- Check the temperature shown by the thermometer (5) and the value of the thermistor (1), as shown on the tester.

Make sure that the value varies according to the temperature, as indicated.

Temperature °F (°C)	Resistance $\Omega$
32 (0)	9750
50 (10)	5970
68 (20)	3740
86 (30)	2410

**NOTE** If, as the temperature changes, the standard values do not change or are greatly different from the values shown in the table, replace the thermistor (2).



- 9) Main injection relay
- 11) Side stand switch
- 19) Battery
- 20) Starter relay
- 21) Starter motor
- 24) Secondary fuses
- 33) Rear stop light switch
- 34) Front stop light switch
- 35) Key commutator
- 37) Right-hand dimmer
- 55) Stop lights relay
- 56) Third stop bulbs



## CHECKING THE STARTER RELAY

- Disconnect the two-way connector (1) (white).

### ⚠ CAUTION

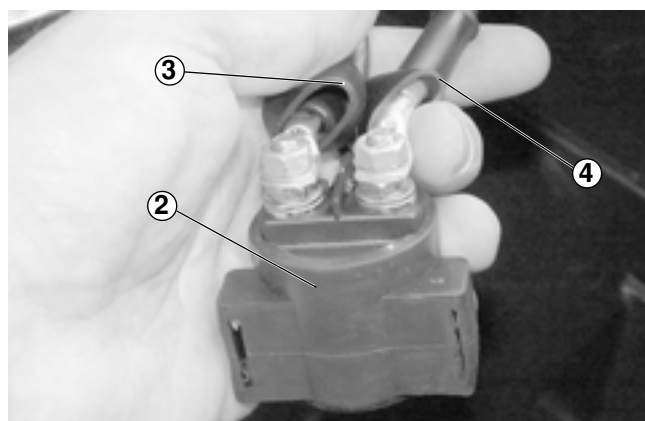
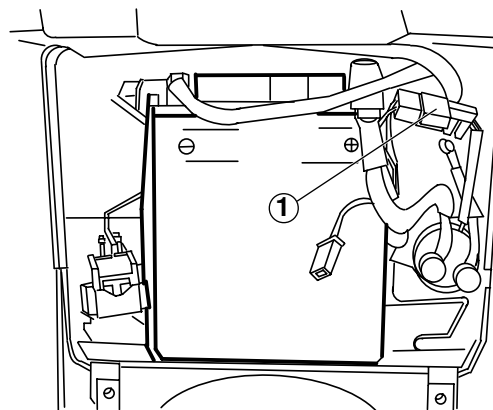
**On reassembly, make sure that the electrical connector (1) is correctly coupled.**

- Slide the relay (2) from its hooks.
- Slide out the two rubber protections (3-4).
- Disconnect the cables from the relevant relay (2) terminals.
- Energize (12 V) the two terminals inside the connector (1) from the relay side.
- Use a tester (set as an ohmmeter) to check the continuity between the two screw contacts on the relay (2).

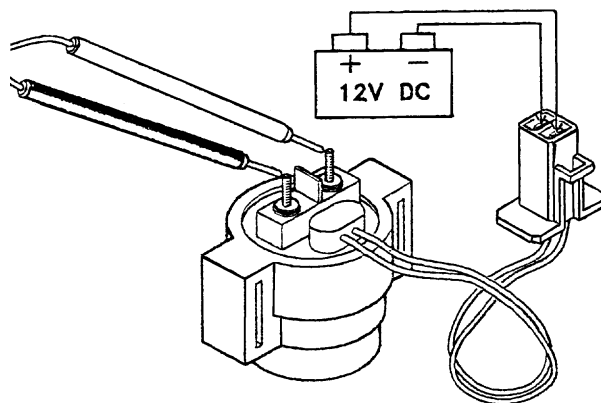
**Correct value with relay energized: 0  $\Omega$**

**Correct value with relay not energized:  $\infty \Omega$**

**If the resulting values do not correspond to those given, replace the relay (2).**



6



## CHECKING THE STOP LIGHTS RELAY

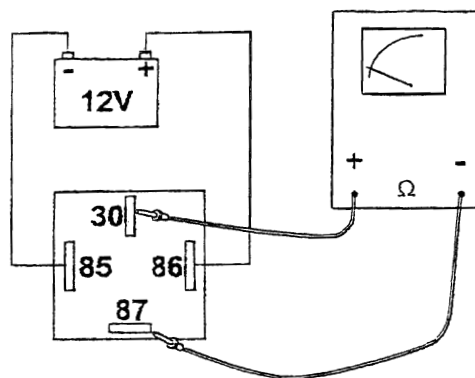
To check the working state of the relay, proceed as follows:

- To access the relay, lift the saddle and remove the left rear light, see (REPLACING THE REAR LIGHT BULBS).
- Energize (12 V) the two male terminals (85-86);
- Use a tester (set as an ohmmeter) to check the continuity between the other two terminals (87-30).

**Correct value with relay energized: 0  $\Omega$**

**Correct value with relay not energized:  $\infty \Omega$**

**If the resulting values do not correspond to those given, replace the relevant relay.**





7) ENGINE STOP SWITCH (○ - ⊗)

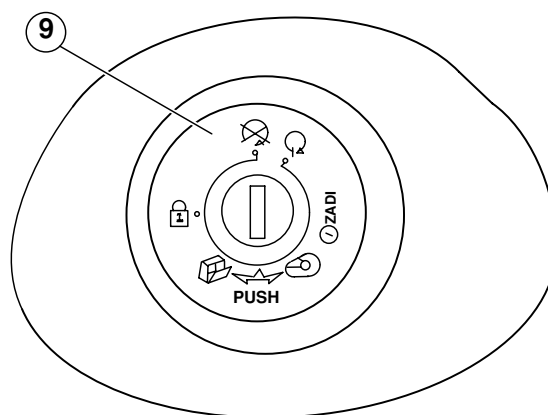
Wires Pos	R/N	R/Gr
⊗		
○	○	○

8) STARTER BUTTON (ⓘ)

Wires Pos	V/G	G/R
ⓘ	○	○

9) IGNITION SWITCH

Wires Pos	G/Gr	G	V/N	R/Bi
⊗				
○	○	○	○	○
ⓘ				

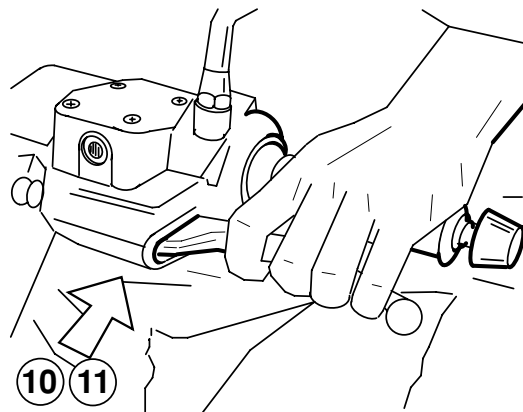


10) FRONT STOP LIGHT SWITCH

Wires Pos	Gr/N	V/G
ON	○	○

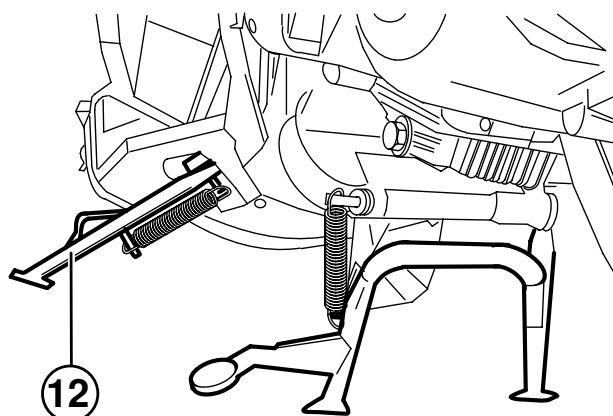
11) REAR STOP LIGHT SWITCH

Wires Pos	V/G	R/N
ON	○	○



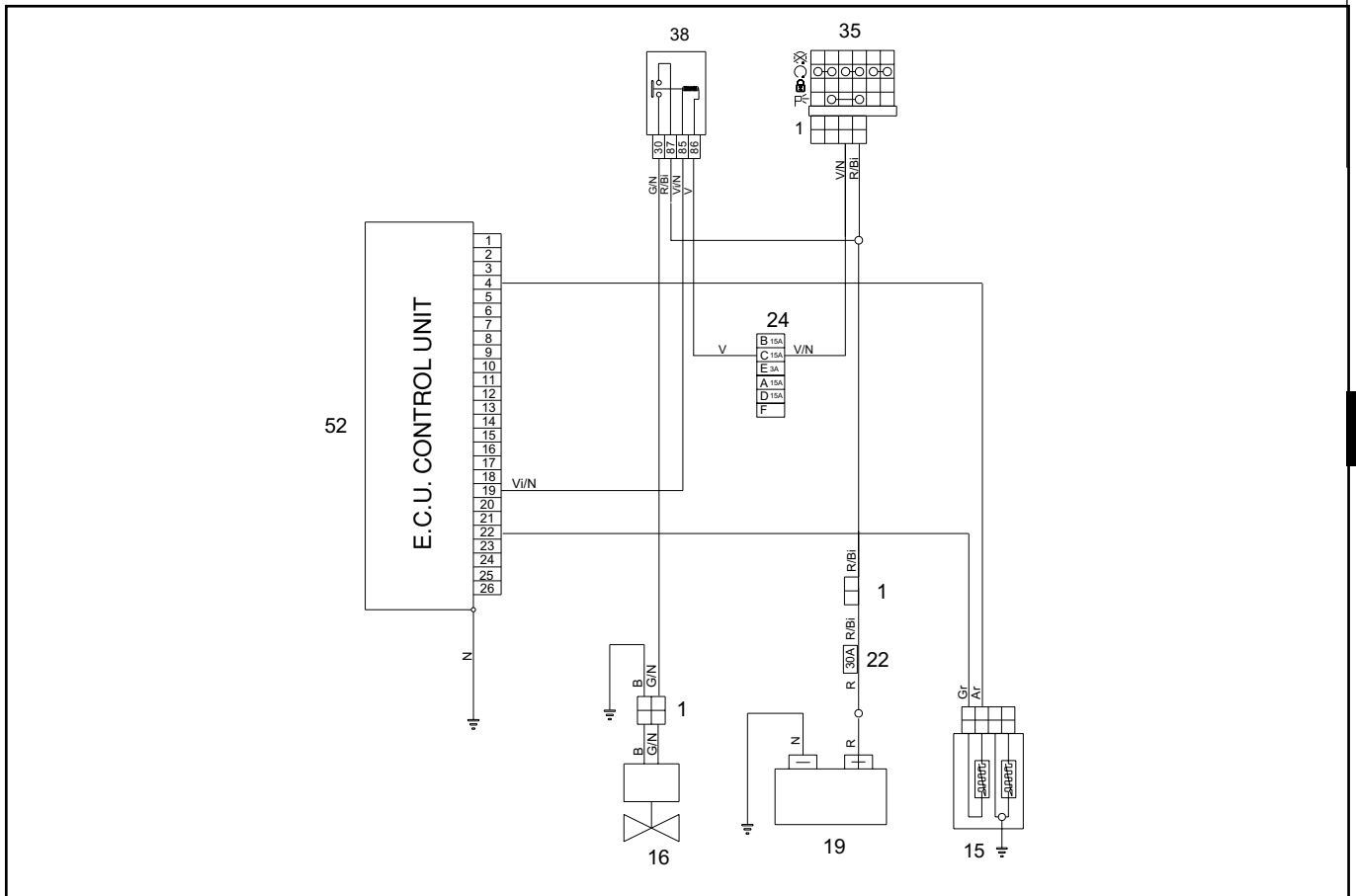
12) SIDE STAND SWITCH

Wires Pos	N (⊕)	V	M
OPEN	○	○	
CLOSED	○		○



## ELECTRIC COOLING FAN

## WIRING DIAGRAM

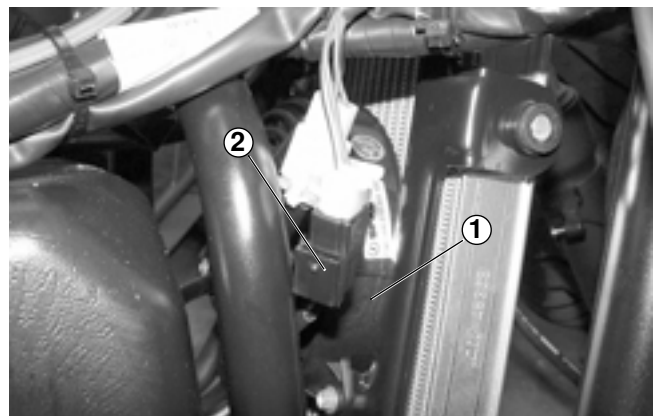


## Key

- 15) Water thermistor
- 16) Fan
- 19) Battery
- 24) Secondary fuses
- 35) Key commutator
- 38) Fan relay
- 52) E.C.U. control unit

## CHECKING THE CONDITION OF THE ELECTRIC FAN

- To check the working state of the fan (1):
- Remove the leg shield, see (REMOVING THE LEG SHIELD).
- Disconnect the electric connection (2) of the electric cooling fan (1) control.
- Directly energize the electric cooling fan with 12 V DC power.



## CHECKING THE WATER THERMISTOR

See (CHECKING THE CONDITION OF THE COOLANT THERMISTOR) on page 6-14.

## CHECKING THE FANS RELAY

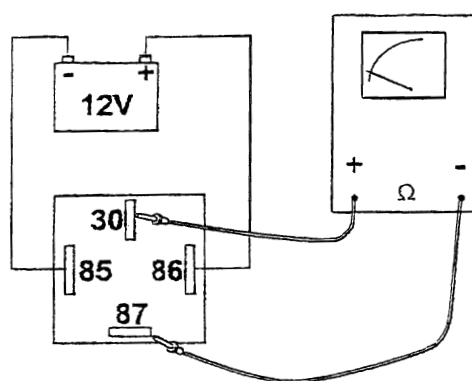
To check the working state of the relay, proceed as follows:

- Remove the rider's saddle, see (REMOVING THE RIDER'S SADDLE).
- Energize (12 V) the two male terminals (85-86).
- Use a tester (as an ohmmeter) to check the continuity between the other two terminals (87-30).

**Correct value with relay energized: 0  $\Omega$**

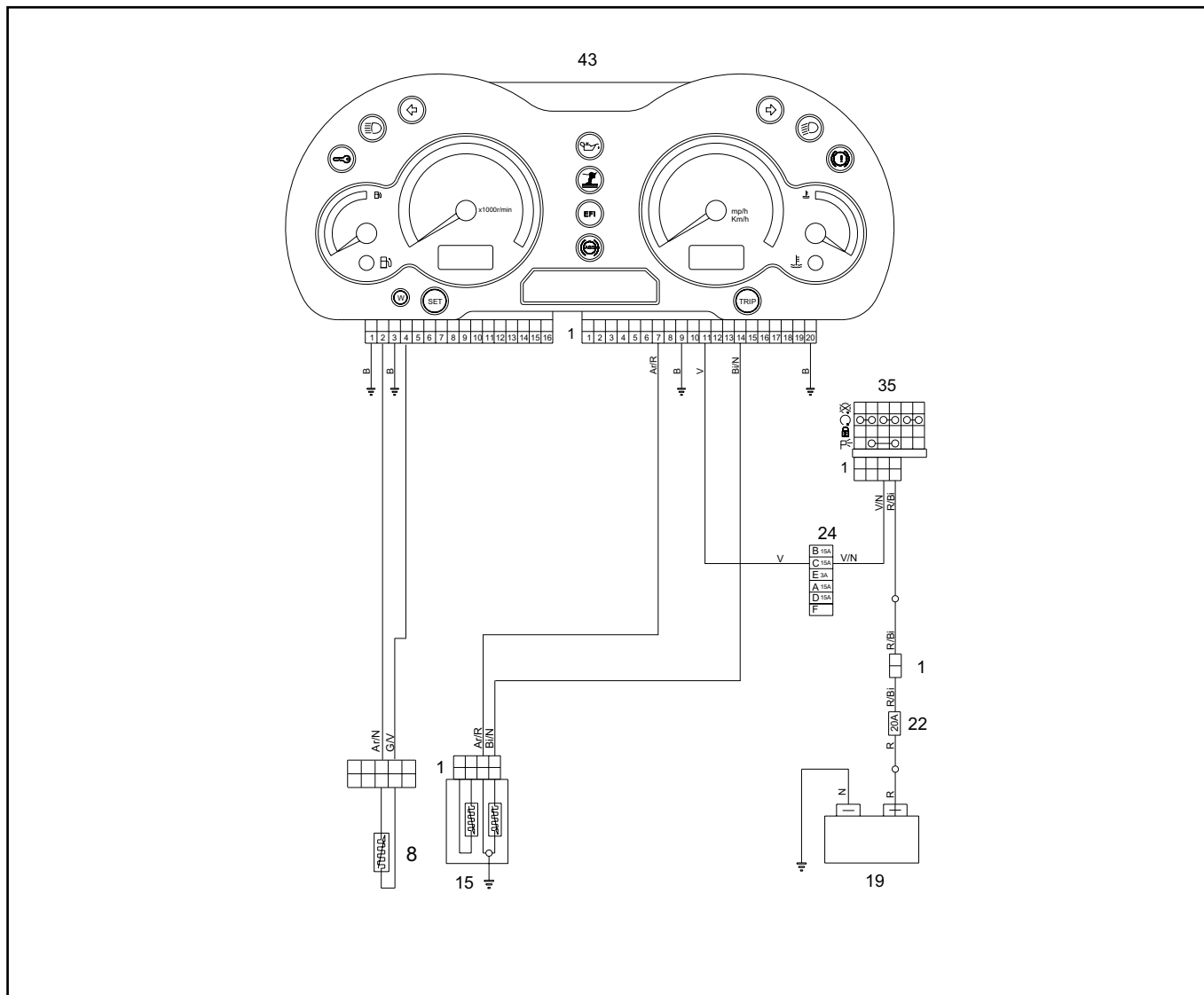
**Correct value with relay not energized:  $\infty \Omega$**

If the values do not correspond to those given, replace the relevant relay switch.



## COOLANT TEMPERATURE AND FUEL LEVEL GAUGE

## WIRING DIAGRAM



## Key

- 8) Fuel level probe
- 15) Water thermistor
- 19) Battery
- 22) Main fuses
- 24) Secondary fuses
- 35) Key commutator
- 43) Dashboard

## WATER TEMPERATURE

### CHECKING THE DASHBOARD

- Disconnect the connector of the water thermistor and connect (from the connector side) an electrical resistor between the orange/red and black/white cables.
- Turn the key to ON and check the signal on the dashboard.

Connector values:

resistance	<60 $\Omega$	indication	bottom of scale
resistance	80 $\Omega$	indication	start of red zone $\pm 5^\circ$
resistance	>1090 $\Omega$	indication	start of scale

### CHECKING THE WATER THERMISTOR

See (CHECKING THE CONDITION OF THE COOLANT THERMISTOR) on page 6-14.

## FUEL LEVEL

### CHECKING THE DASHBOARD

- Disconnect the connector of the pump assembly and connect (from the connector side) an electrical resistor between the yellow-green and orange-black cables.
- Turn the key to ON and check the signal on the dashboard.

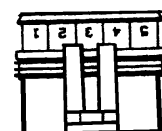
Connector values:

resistance	250 $\Omega$	indication	1/2 scale $\pm 5^\circ$
resistance	3 $\Omega$	indication	full
resistance	820 $\Omega$	indication	empty and indicator on

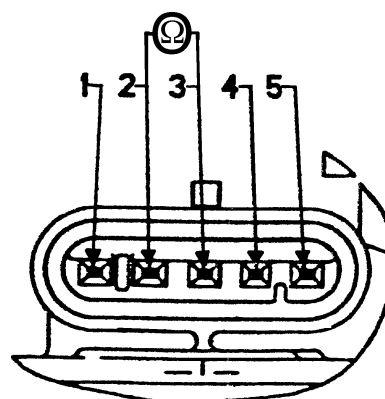
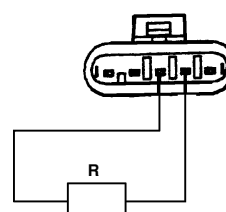
### CHECKING THE FUEL LEVEL SENSOR

- Disconnect the connector of the pump/sensor assembly.
- Connect an ohmmeter to terminals 2 and 3 and check the indication at different fuel levels.

Correct value with full tank: less than 16  $\Omega$   
 Correct value with 8 liters of fuel: 300-400  $\Omega$   
 Correct value with 0 liters: greater than 800  $\Omega$

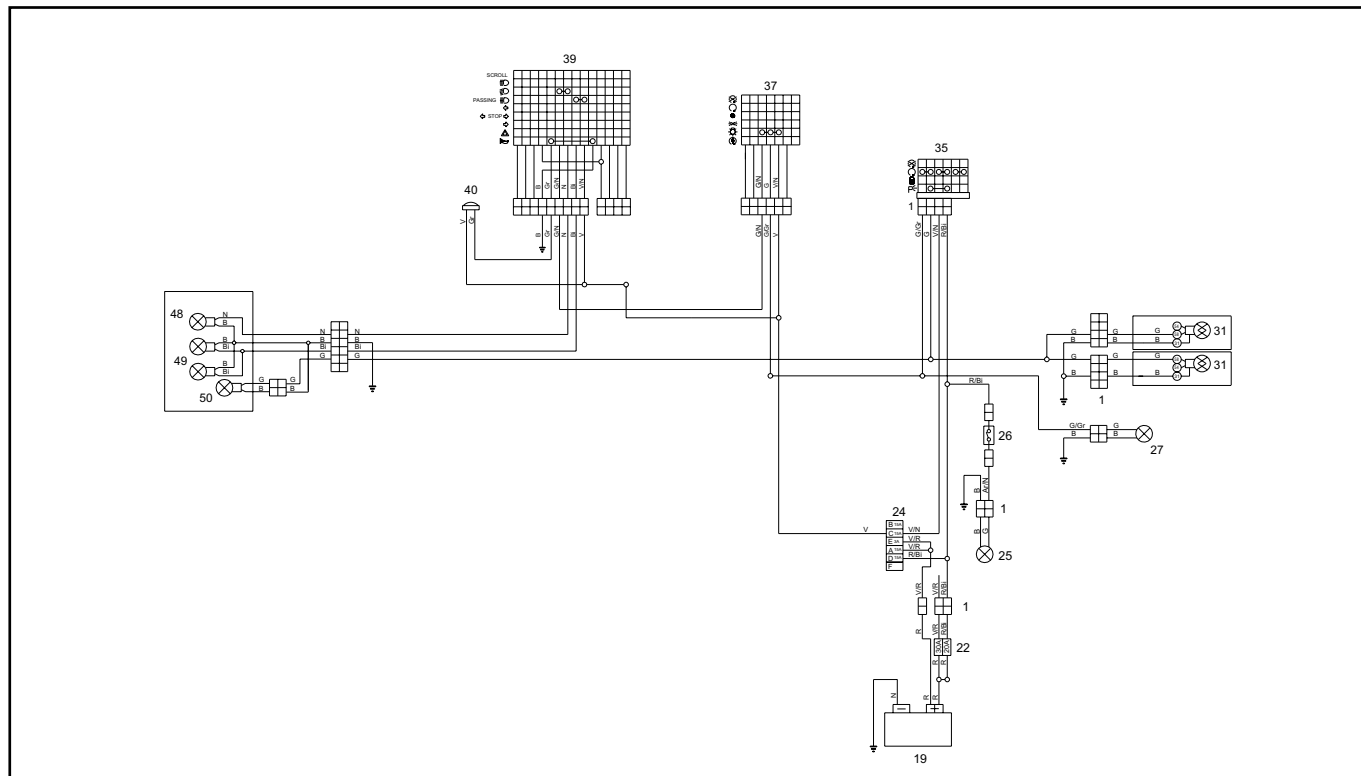


SEEN FROM "A"



## LIGHTING AND SOUND SIGNAL SYSTEM

## WIRING DIAGRAM



## Key

- 19) Battery
- 22) Main fuses
- 24) Secondary fuses
- 25) Helmet compartment light
- 26) Helmet compartment switch
- 27) License plate light
- 31) Stop/position light
- 35) Key commutator
- 37) Right dimmer
- 39) Left dimmer
- 40) Horn
- 48) Low beam lamps
- 49) High beam lamps
- 50) Position light lamp

## CHECKING THE HORN

Directly energize (12 V) the horn at the ends of the two terminals.

If the horn does not work, use the relevant register.

If necessary, replace.

## CHECKING THE HELMET COMPARTMENT LIGHT SWITCH

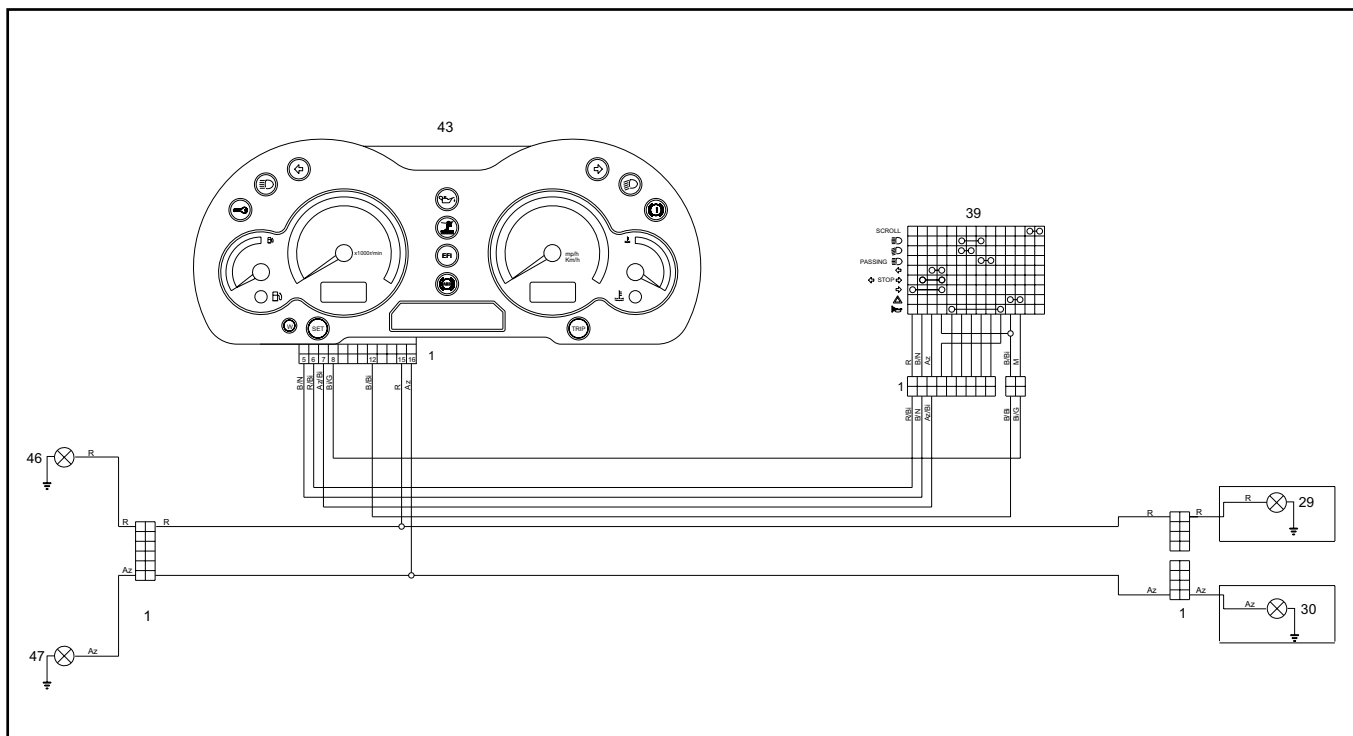
Use a tester (as an ohmmeter) to check the continuity between the two terminals.

With switch released (saddle up): value  $\infty \Omega$

With switch pressed (saddle down): value  $\infty$

## DIRECTION INDICATORS AND DISPLAY DATA

## WIRING DIAGRAM



## Key

- 29) Right rear direction indicator
- 30) Left rear direction indicator
- 39) Left dimmer
- 43) Dashboard
- 46) Front right direction indicator
- 47) Front left direction indicator

## HANDLEBAR LEFT SIDE CONTROLS

**NOTE** The electrical components only work when the ignition switch is in the “○” position.

**MODE BUTTON (MODE)**

Press repeatedly to select the different data shown on the multifunction LCD.

**HAZARD BUTTON (▲)**

**ENABLING** Press to enable the four indicators. At this point, it is possible to turn the ignition switch to the “⊗” position and to remove the key.

**DISABLING**

Insert the key into the ignition switch and turn it to the “○” position; press the HAZARD button again to disable the system.

**NOTE** The flashing frequency of the hazard lights will not vary, even if one of the bulbs has burned out.

## MULTIFUNCTION LCD

When the ignition key (1) is turned to position “○”, on the multifunction LCD all segments are activated (this performs a functional test of the components) and the last function set after the vehicle was stopped will be displayed.



### ⚠ CAUTION

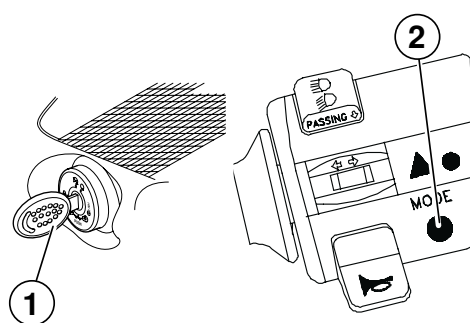
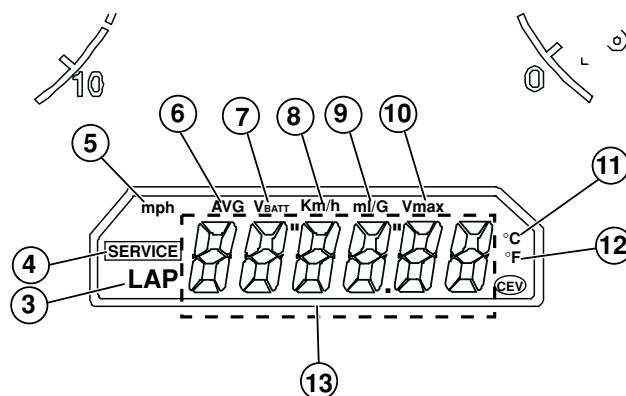
**After the first 1,000 Km and every 6,000 Km thereafter, the message SERVICE appears on the display.**

**In this case contact an *aprilia* dealer to carry out the operations described in the scheduled maintenance chart, see pages 2-3 (SCHEDULED MAINTENANCE CHART).**

The various functions are selected and then shown on the display by pressing the button (MODE) (2) located on the controls on the left side of the handlebar.

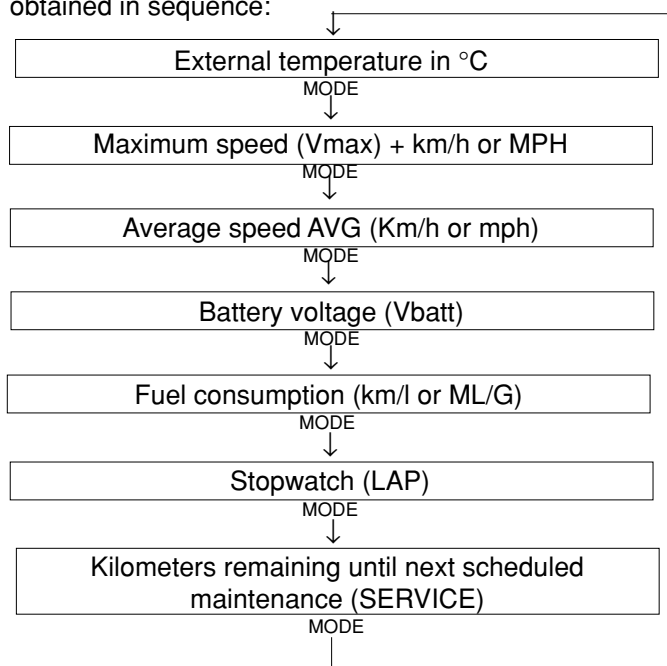
The following segments make up the multifunction LCD:

Stopwatch function indicator (3), scheduled maintenance due icon (4), average speed icon in miles per hour (mph) (5), average speed (6), battery voltage icon (7), average speed expressed in kilometers per hour icon (Km/h) (8). (The same icon is used for the “consumption levels” function expressed with the symbol Km/l), consumption levels espresso in ml/G (used only for the   versions) (9), maximum speed icon (10), external temperature icon expressed in degrees Celsius (°C) (11), external temperature icon expressed in degrees Fahrenheit (°F) (12), six-digit display of the values for the functions set and identified by the corresponding icons (13).



6

Pressing the MODE key, the following functions are obtained in sequence:





## RESETTING THE AVERAGE SPEED, MAXIMUM SPEED, FUEL CONSUMPTION LEVELS AND STOPWATCH VALUES

**NOTE** the corresponding information may be reset only if the right digital display shows the odometer.

Hold down the key (1) (TRIP/RESET) for more than three seconds.

**NOTE** The function displayed will be reset.

## START/STOP AND RESETTING THE STOPWATCH

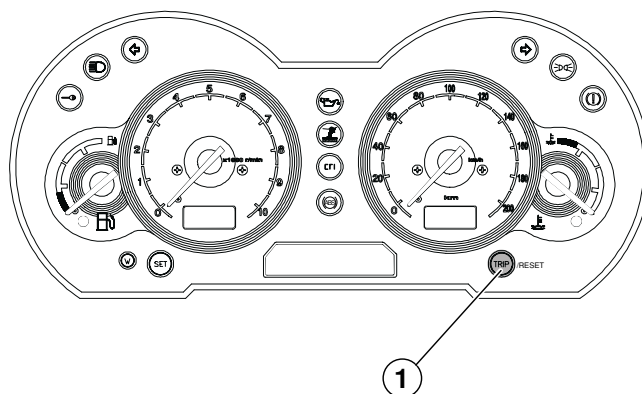
**NOTE** the corresponding information may be reset only if the right digital display shows the odometer.

### START/STOP:

hold down the key "MODE" (2) for more than three seconds.

### RESET:

Hold the key (1) (TRIP/RESET) down for longer than three seconds only when the stopwatch is stopped.

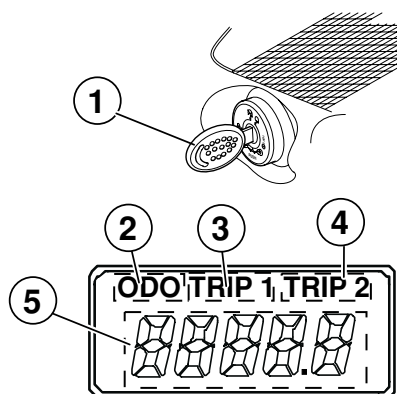


## DIGITAL ODOMETER

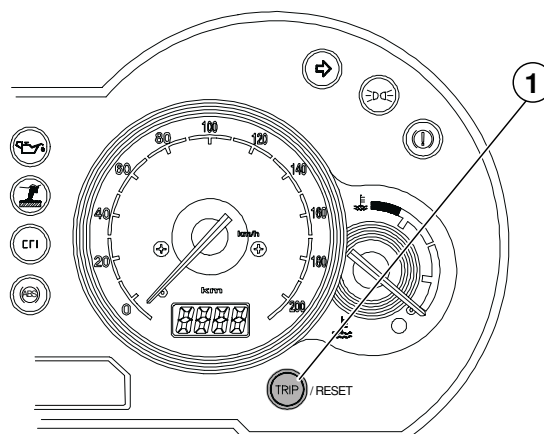
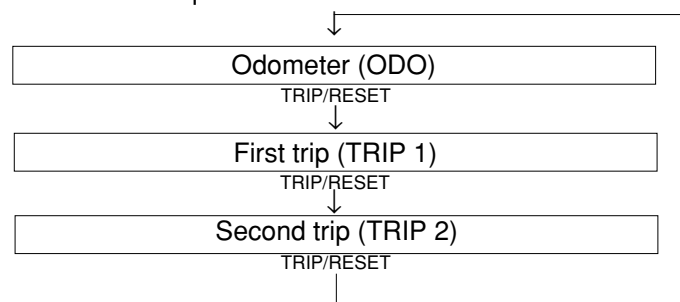
**NOTE** The LCDs operate only with the ignition switch set to "O".

When the ignition key (1) is turned to position "O", all segments are activated on the LCD to perform a functional test of components, and the odometer will always be displayed.

The following segments make up the LCD:  
Odometer display icon (2), first trip display icon (3), second trip display icon (4), five-digit display of the values corresponding to the selected functions (5).

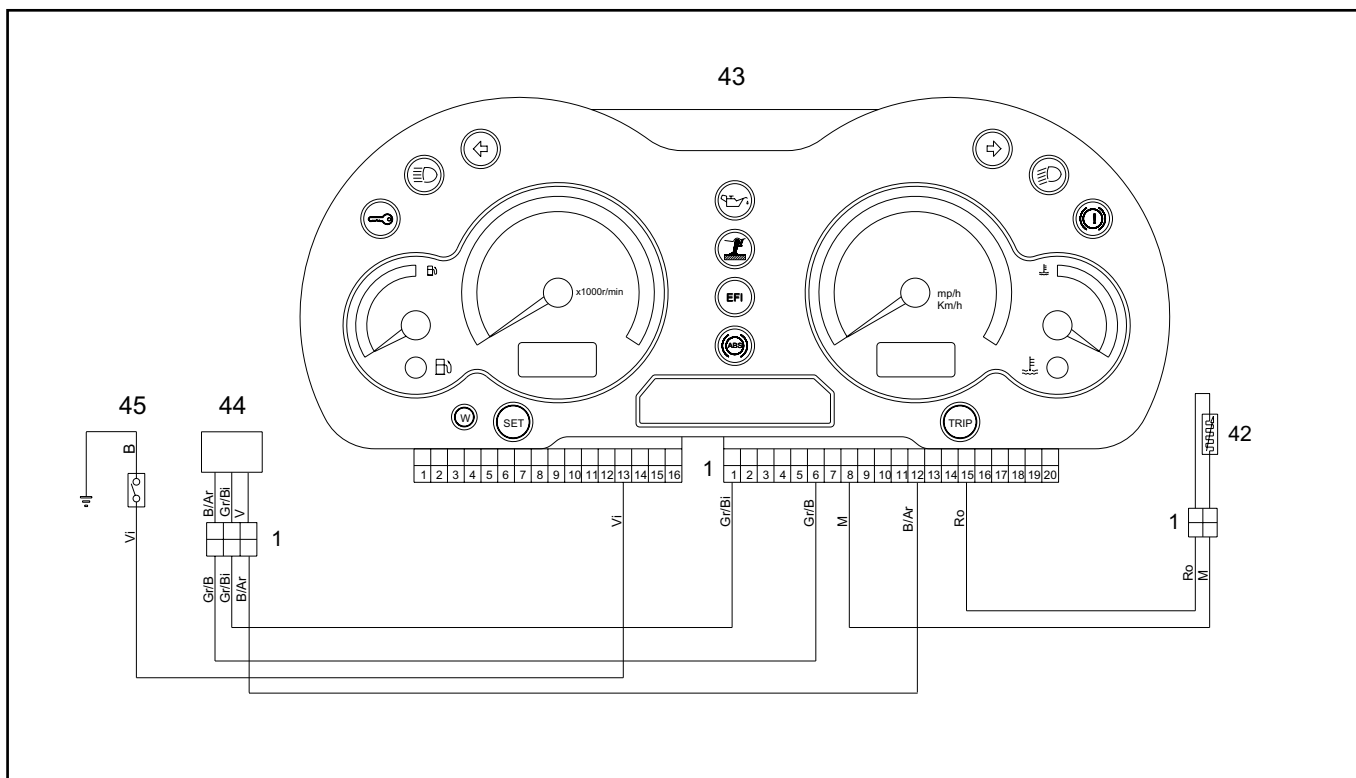


Pressing the TRIP/RESET key produces the following functions in sequence:



## VISUAL SIGNALS AND SPEEDOMETER


## WIRING DIAGRAM





## Key

- 42) Dashboard air temperature thermistor
- 43) Dashboard
- 44) Speed sensor
- 45) Oil pressure sensor

## CHECKING THE DASHBOARD

- If the dashboard is working correctly, when the ignition switch is in the “○” position, the red LED “” of the oil pressure should light up.

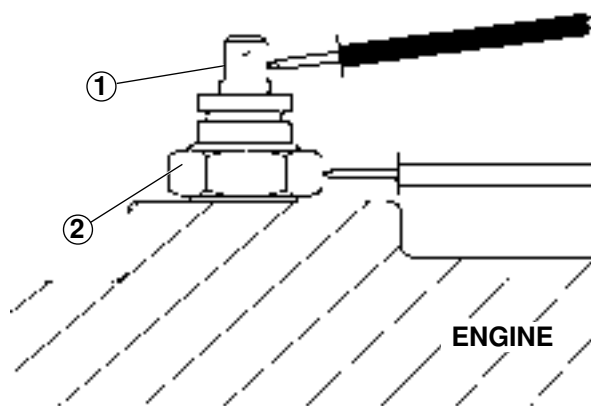
## CHECKING THE SENSOR

- When the ignition switch is in the “○” position, the red LED “” of the engine oil pressure should light up.
- If the red LED “” does not light up, check the working state of the sensor.
- Use a tester (scale 100  $\Omega$ ) to check the continuity between the tab terminal (1) and the body of the sensor (2) (see figure).

**Correct value (engine off): 0  $\Omega$**

**Correct value (engine on):  $\infty$   $\Omega$**

If the values do not correspond to those given, check to see that the engine oil level is correct, see (CHECKING THE ENGINE OIL LEVEL AND TOPPING UP) and replace the sensor, if necessary.



## SPEEDOMETER

- Check the correct coupling of the speed sensor connector (1).
- Check the correct coupling of the dashboard connectors (2).
- Check the distance between the speed sensor (3) and the screws (4) that fasten the front brake disc.

**Distance between sensor (3) and screws (4):  $1.5 \pm 1$  mm.**

- Make sure that all screws (4) are fitted.

Carry out the following tests with the engine off and the ignition switch in the "O" position:

### 1<sup>st</sup> Test

- Without disconnecting the speed sensor connector (1), connect a tester and measure the voltage between the gray/blue (Gr/B) and blue/orange (B/Ar) cables.

**Correct value: > 9 V (c.c.).**

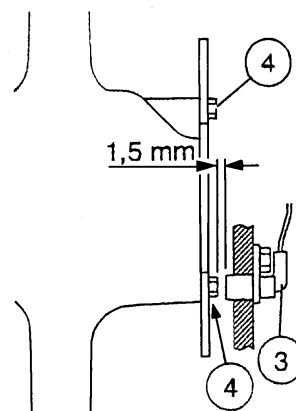
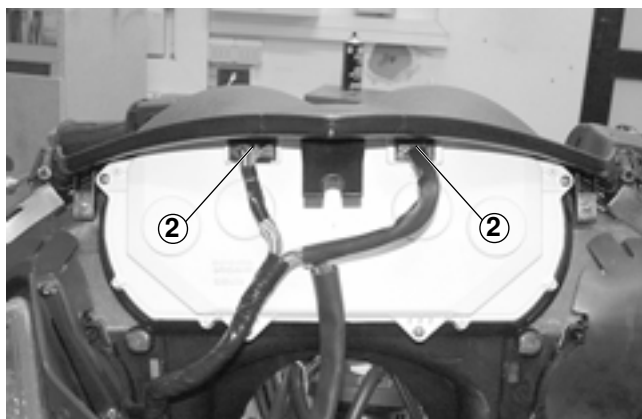
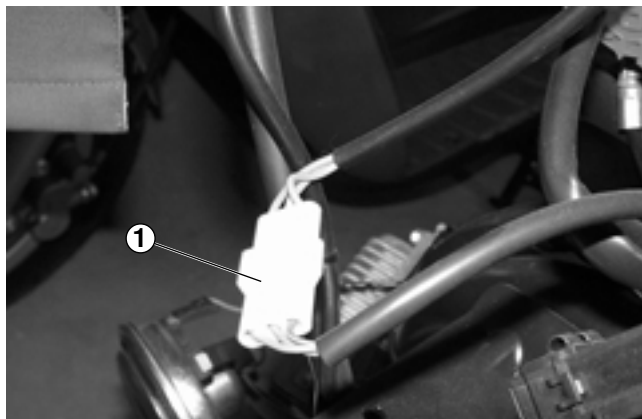
### 2<sup>nd</sup> Test

- Without disconnecting the speed sensor connector (1), connect a tester and measure the voltage between the gray/white (Gr/Bi) and blue/orange (B/Ar) cables.

**Correct value: > 6 V (c.c.).**

### 3<sup>rd</sup> Test

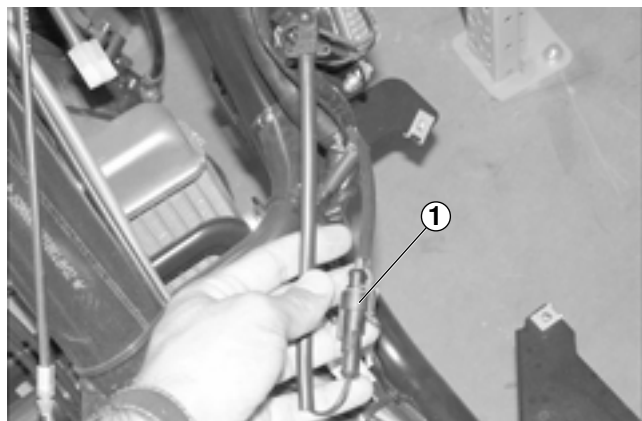
- Place the vehicle on the rear support stand **OPT**
- Carry out the 2<sup>nd</sup> test.
- Turn the front wheel by hand so that one of the screws (4) is level with the sensor (3). The tester reading will move to **zero V** for approximately 2 seconds before returning to > 6 V.
- If the 1<sup>st</sup> test shows an incorrect value, disconnect the sensor (3) and repeat the test; if the value remains incorrect, the dashboard is faulty and must be replaced with a fully operational one.
- If the 1<sup>st</sup> test shows a correct value but the 2<sup>nd</sup> test shows an incorrect value, the sensor (3) is faulty and must be replaced.
- If the 1<sup>st</sup> and 2<sup>nd</sup> test both show correct values but the 3<sup>rd</sup> test has an incorrect value, the sensor (3) is faulty and must be replaced.
- If all three tests show correct values but the speed still does not appear on the left dial on the dashboard, the dashboard is faulty and must be replaced with a fully operational one.



**AIR TEMPERATURE SENSOR**

To check the working state of the air temperature sensor, proceed as follows:

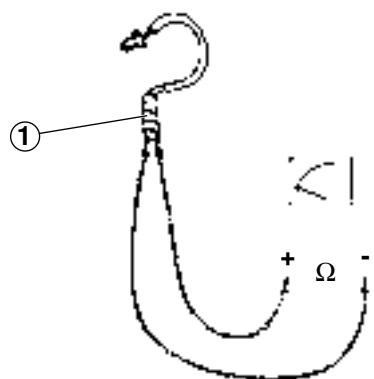
- Disconnect the two-way connector (1).
- Check the sensor in an environment with a controlled temperature of 68 °F (20 °C).



- Use an ohmmeter (scale 0-20 k $\Omega$ ) to measure electrical resistance between the terminals of the connector (1).

**Correct value: 12.200 k $\Omega$  - 12.700 k $\Omega$**

If the air temperature sensor is operating correctly, check the dashboard:



- Apply a resistance of 12.4 k $\Omega$  between the sensor terminals (cabling side).
- If the dashboard is operating correctly, it should show a temperature of 68  $\pm$  3 °F (20  $\pm$  1 °C).

## SWITCHES

Using a portable tester, check the continuity of the switches, and refer to the specific table for each switch.

Replace the switch if it is faulty.

## 1) HORN BUTTON (🔊)

Wires Pos	Gr	B
🔊	○	○

## 2) DIRECTION INDICATOR SWITCH (↔↔)

Wires Pos	B/Bi	Az	R	B/N
↔	○	○		
↔	○		○	
↔ STOP ↔	○			○

3) HIGH/LOW BEAM SELECTOR (🔦 - 🔦) /  
HIGH BEAM BLINK BUTTON  
(PASSING 🔦)

Wires Pos	G/N	N	Bi	V/N
🔦	○		○	
🔦	○	○		
PASSING 🔦			○	○

## 4) MODE BUTTON (MODE)

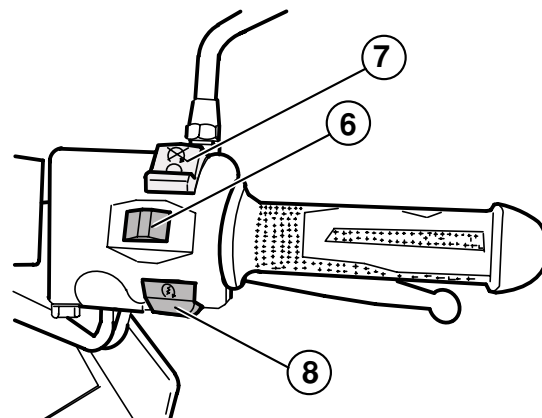
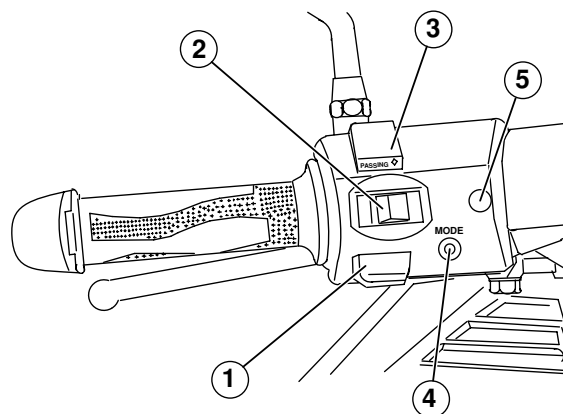
Wires Pos	Ro	V
SCROLL	○	○

## 5) HAZARD BUTTON (⚠)

Wires Pos	B/Bi	M
⚠	○	○


## 6) LIGHTS SWITCH (🔦 - 🔦 - 🔦)

Wires Pos	V/N	G	G/N
•			
🔦	○	○	
🔦	○	○	○



## CHANGING BULBS

### ⚠ WARNING

Before changing a bulb, turn the ignition switch to the “” position and wait a few minutes so that the bulb cools down. Change the bulb wearing clean gloves or using a clean and dry cloth. Do not leave fingerprints on the bulb, since these may cause its overheating and consequent breakage. If you touch the bulb with your bare fingers, remove any fingerprints with alcohol in order to avoid any damage.

**TAKE CARE TO AVOID DAMAGING THE ELECTRIC CABLES.**

## CHANGING THE HEADLIGHT BULBS

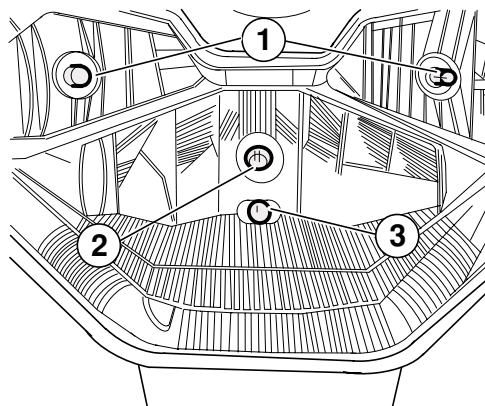
**Read carefully (BULBS).**

The headlight contains:

- two high beam bulbs (1).
- one low beam bulb (2).
- one parking light bulb (3).

To replace:

- Removing the front hood, see (REMOVING THE FRONT HOOD).



## LOW BEAM BULBS

### ⚠ CAUTION

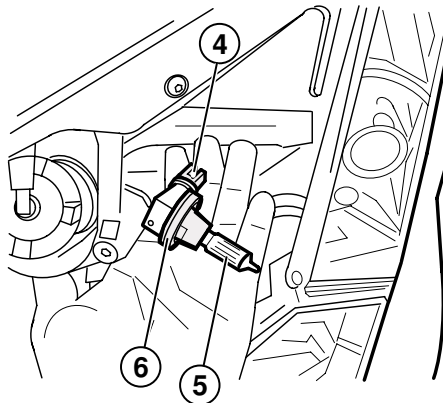
**To extract the bulb electric connector, do not pull its electric wires.**

- Grasp the bulb electric connector (4), pull it and disconnect it from the bulb (5).
- Rotate the bulb socket (6) counterclockwise and extract it from the seat.
- Remove the bulb (5).

During reassembly:

**NOTE** Insert the bulb (5) in the reflector seat, aligning the three notches on the bulb with the corresponding guides on the reflector seat.

- Place the bulb socket (6) in the reflector seat and turn it clockwise.
- Connect the bulb electric connector (4).



## BATTERY

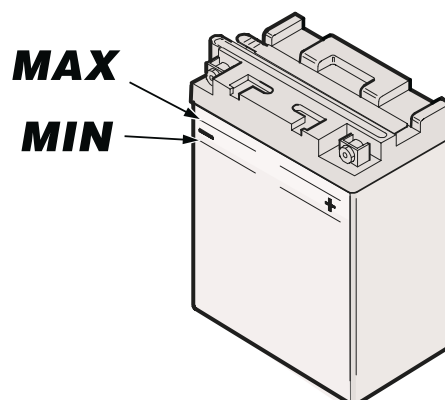
For safety standards and general information about the battery, see (BATTERY).

For all other information, see (CHECKING THE ELECTROLYTE LEVEL), (RECHARGING THE BATTERY) and (LEAVING THE BATTERY IDLE FOR LONG PERIODS).

### ACTIVATING THE BATTERY

Carefully read (BATTERY).

- Remove the battery cover, see (REMOVING THE BATTERY COVER).
- Remove the battery, see (REMOVING THE BATTERY).
- Check the electrolyte level in the battery, see (CHECKING THE ELECTROLYTE LEVEL).
- Recharge the battery, see (RECHARGING THE BATTERY).

**6**

### RETURN UNDER WARRANTY

Carefully read (BATTERY).

The warranty will be considered null and void if the battery shows signs of the following:

- Damage (dented container, bent poles, etc.).
- Diffuse sulphation (incorrect activation and/or use of the battery).
- Insufficient electrolyte fluid level (to prevent leakage during shipment, it is sufficient to close the bleeder with the relevant cap).
- Missing components (caps, etc.).



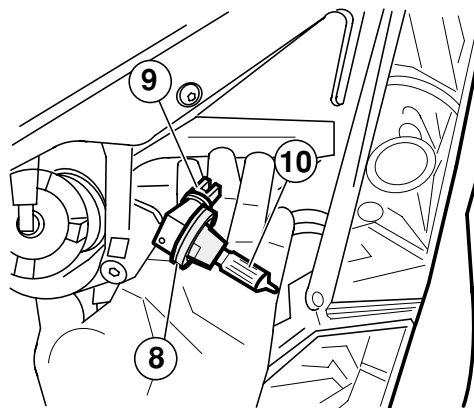
## HIGH BEAM BULBS

- Turn the bulb socket/bulb (8) counter-clockwise and remove it from the reflector seat.

### ⚠ CAUTION

To remove the bulb socket/bulb from the connection, be especially careful not to damage the two tabs (9).

- Remove the bulb (10).
- Correctly install a new bulb of the same type.
- For reassembly, proceed in reverse order.

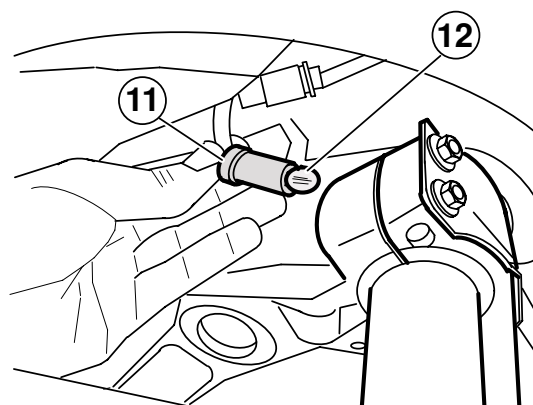


## PARKING LIGHT BULBS

### ⚠ CAUTION

To remove the bulb socket do not pull the electrical cables.

- Working from the front of the vehicle, grasp the bulb socket (11), turn it and extract it from the seat.
- Remove the parking light bulb (12) and replace it with another of the same type.



## CHANGING TAILLIGHT BULBS

Read carefully (BULBS).

The taillight houses:

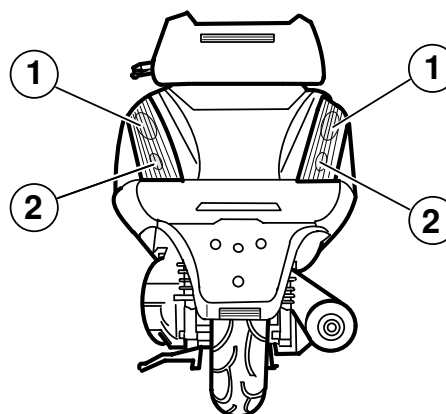
- Two parking light/brake light bulbs (1).
- Two rear direction indicator lamps (2).

To replace:

- Lift the saddle, see (LOCKING/RELEASING THE SADDLE).

**NOTE** The following information refers to a single indicator, but is applicable to both.

- Remove the knob (3) fastening the set of taillights to the vehicle.



**⚠ CAUTION**

During the following operations do not pull or force the electrical cables.

- Pull out the set of taillights (4), first removing the upper part and then distancing it from the housing.

**⚠ CAUTION**

Work very carefully.

Do not damage the tabs and/or slots into which they are fitted.

- Working with the set of taillights in hand, turn it counter-clockwise and extract the bulb socket (5) with the bulb (6) of the reflector (4).
- Remove the bulb from its seat.

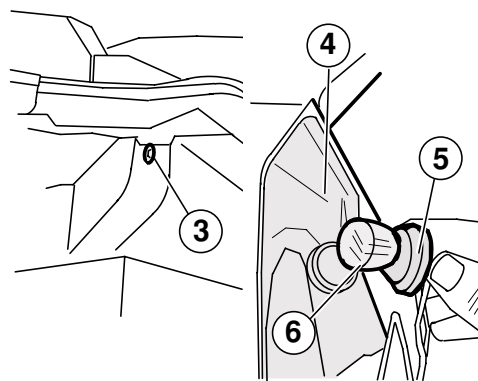
**NOTE** Insert the bulb in the bulb socket, carefully aligning the two bulb pins with their guides in the socket.

- Correctly install a new bulb of the same type.

**NOTE** During reassembly, position the lens correctly in its seat.

**⚠ CAUTION**

Tighten the screw (3) gently and carefully to avoid damaging the lens.



6

## CHANGING THE FRONT DIRECTION INDICATOR LAMPS

Carefully read alongside (BULBS).

To replace:

- Removing the front hood, see (REMOVING THE FRONT HOOD). Alternatively, it is possible to remove the case covers to reach the bulbs (see REMOVING THE DASHBOARD).

**⚠ CAUTION**

Work very carefully. Do not damage the tabs and/or slots into which they are fitted.

For the LEFT direction indicator:

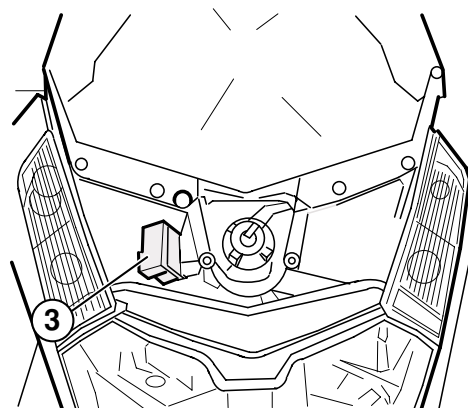
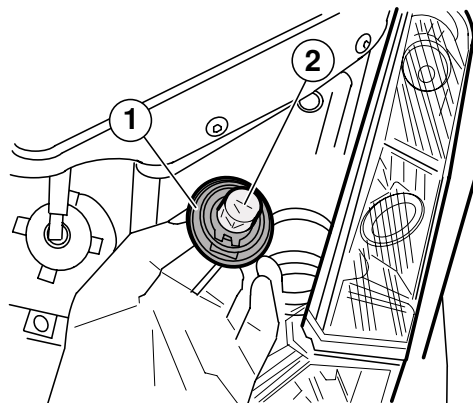
- Working from the front of the vehicle, turn the support (1) holding bulb (2) clockwise, and extract both from their housing.
- Push the bulb (2) in slightly and rotate it counter-clockwise.
- Remove the bulb from its seat.

**NOTE** Insert the bulb in the bulb socket, carefully aligning the two bulb pins with their guides in the socket.

- Correctly install a new bulb of the same type.
- For reassembly, proceed in reverse order.

For the RIGHT direction indicator:

- Remove the secondary fuse box (3) from its seat to make room to work.
- Then proceed as described for the left direction indicator.



## CHANGING THE LICENSE PLATE LAMP BULB

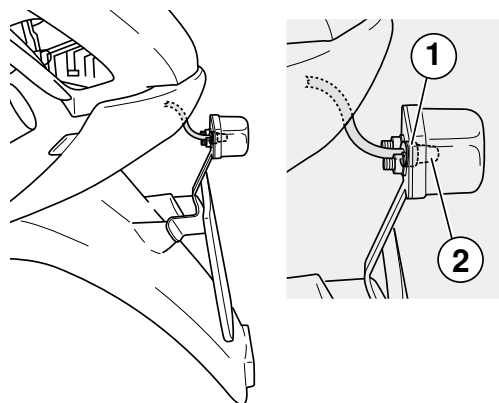
Carefully read (BULBS).

To replace:

### ▲ CAUTION

**Do not pull on the wires to remove the bulb socket.**

- Grasp the socket (1), pull it and remove it from its seat.
- Remove the bulb (2) and replace it with another of the same type.



## CHANGING THE HELMET COMPARTMENT LIGHT BULB

Carefully read (BULBS).

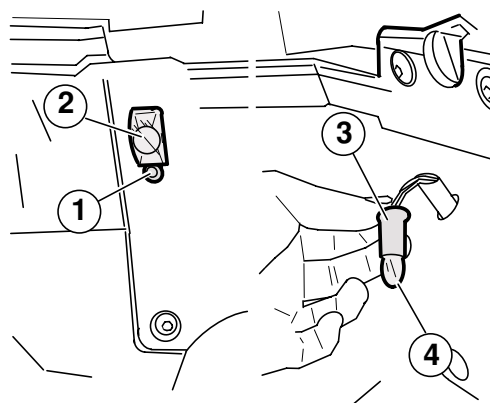
To replace:

- Lift the saddle, see (LOCKING/RELEASING THE SADDLE).
- Loosen and remove the screw (1) fastening the transparent part to the battery cover.
- Remove the transparent part (2) by pulling it downward.

### ▲ CAUTION

**Do not pull on the wires to remove the bulb socket.**

- Grasp the socket (3), pull it and remove it from its seat.
- Remove the bulb (4) and replace it with another of the same type.



## CHANGING THE THIRD STOP LIGHT BULBS

Carefully read (BULBS).

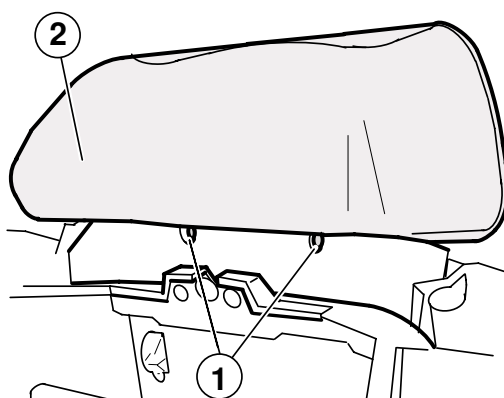
To replace:

- Lift the saddle, see (LOCKING/RELEASING THE SADDLE).
- Loosen and remove the two screws (1) that fix the backrest to the vehicle.

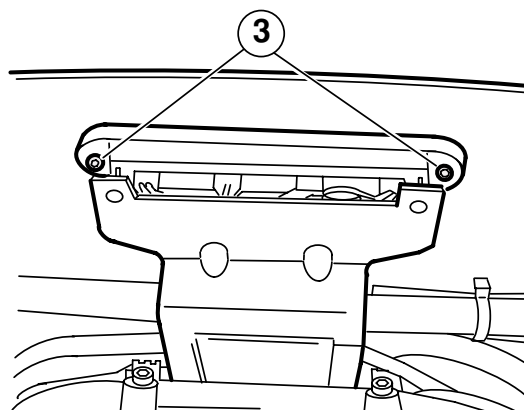
### ▲ CAUTION

**Proceed with care when removing the backrest in order not to break the insertion tabs.**

- Remove the backrest (2) by pulling it upwards.



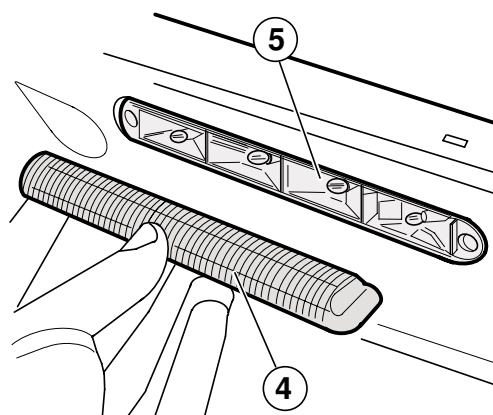
- Loosen and remove the two screws (3) that fasten the protective shield (4) of the third stop light.
- Slide the all-glass bulb (5) from its socket.
- Correctly fit a bulb of the same type.



**NOTE** On reassembly, place the protective shield correctly in its seat.

**CAUTION**

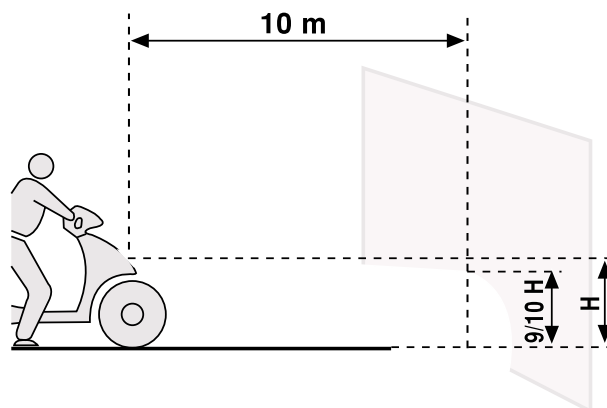
Tighten the screw (3) slightly and with care to avoid damaging the protective shield.



6

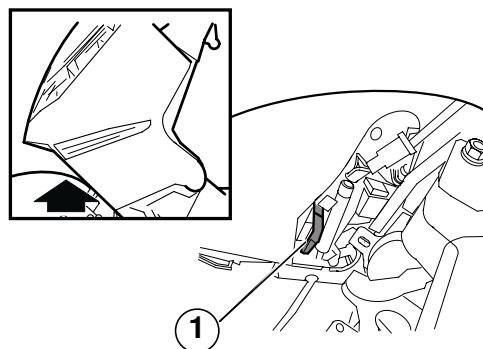
## VERTICAL ADJUSTMENT HEADLIGHT BEAM

- To quickly check the correct adjustment of the beam, place the vehicle on flat ground, 32.81 ft (10 m) away from a wall.
- Switch on the headlight, sit on the vehicle and make sure that the headlight beam projected onto the wall is just below the horizontal line of the projector (approximately 9/10 of the total height).



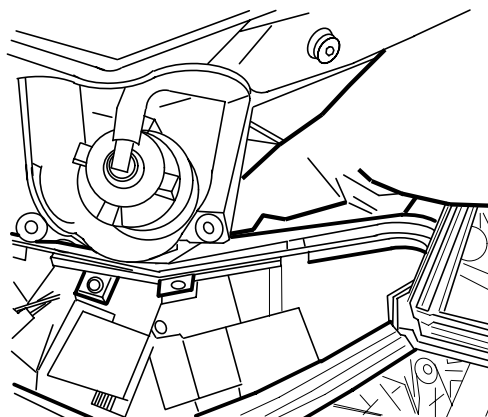
To adjust the headlight beam:

- Adjust the knob (1) provided from the front of the vehicle.
- Turn CLOCKWISE to adjust the beam higher.
- Turn COUNTER-CLOCKWISE to adjust the beam lower.



## HORIZONTAL ADJUSTMENT HEADLIGHT BEAM

- Remove the front hood, see (REMOVING THE FRONT HOOD).
- To adjust the headlight beam:
- Adjust the knob (as shown in the figure) from the front of the vehicle.
  - Turn **CLOCKWISE** to move the beam to the **RIGHT** (facing the direction in which the vehicle travels).
  - Turn **COUNTER-CLOCKWISE** to move the beam to the **LEFT** (facing the direction in which the vehicle travels).



## CHANGING FUSES

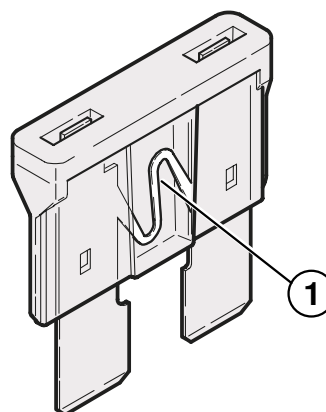
Carefully read (MAINTENANCE).

### ⚠ CAUTION

**Do not attempt to repair faulty fuses.**  
**Never use any fuses other those specified.**  
**Such use could damage the electrical system or even cause a fire, in the event of a short-circuit.**

**NOTE** If a fuse blows frequently, there is probably a short circuit or overload in the electrical system. In this case see an aprilia dealer.

- Check the fuses whenever an electric component does not work or works irregularly, or if the vehicle fails to start.
- First check the 3 A and 15 A fuses and then the 20-30 A fuses.

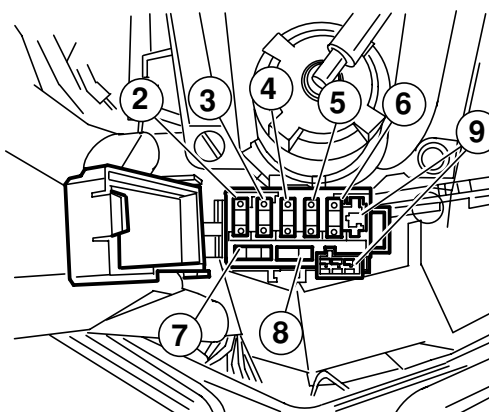


### To check:

- Remove the battery cover, see (REMOVING THE BATTERY COVER) or remove the front hood, see (REMOVING THE FRONT HOOD).
- Remove the fuses one by one, and check to see whether the filament (1) is blown.
- Before replacing the fuse, if possible, try to determine the cause of the problem.
- Replace any blown fuse with a new fuse with the same amperage rating.

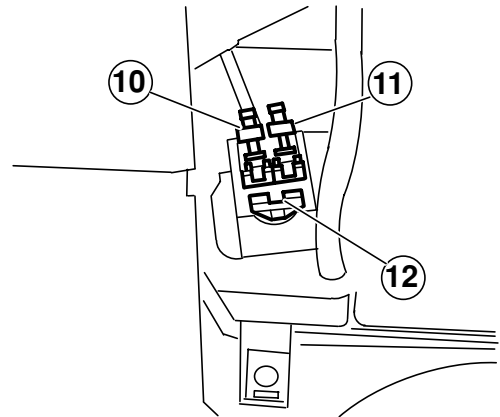
**NOTE** If you use the spare fuse, replace it as soon as convenient.

- Replace the battery cover, see (REMOVING THE BATTERY COVER) or replace the front hood, see (REMOVING THE FRONT HOOD).



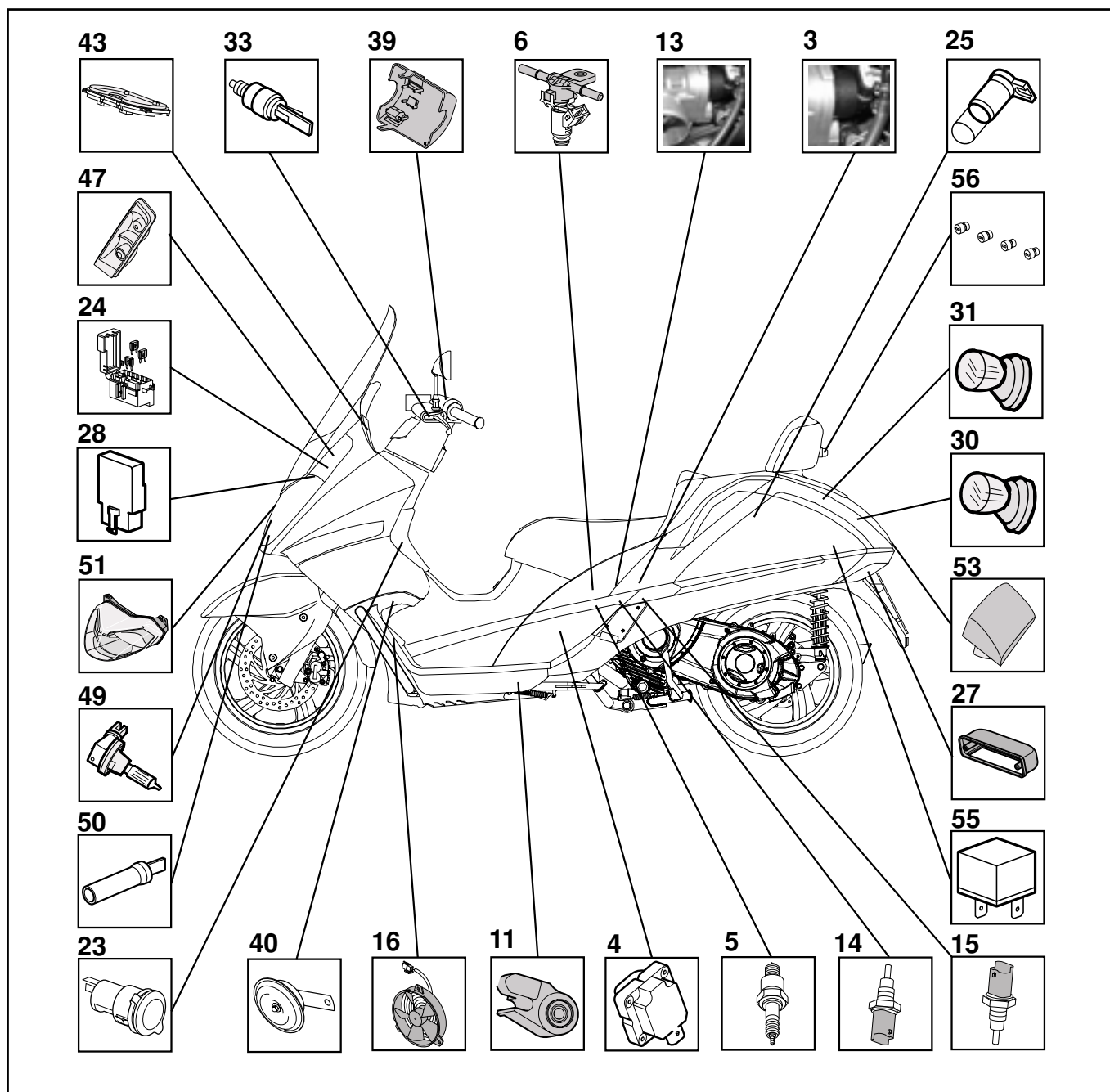
**SECONDARY FUSE LAYOUT  
(FRONT HOOD)**

- **15A Fuse (2)**  
From voltage regulator to: injection, rear brake/starting lights logic (Seat A on the wiring diagram).
- **15A Fuse (3)**  
From ignition switch to: engine kill, rear brake lights logic (Seat B on the wiring diagram).
- **15A Fuse (4)**  
From ignition switch to: lights, horn, dashboard, fan relay, radio power supply (Seat C on the wiring diagram).
- **15A Fuse (5)**  
From the main fuse to the power socket in the storage compartment.
- **3A Fuse (6)**  
From the voltage regulator to the permanent power supply of the ECU Control unit (Slot E on the wiring diagram).
- **15A Fuse (7)**  
Spare.
- **3A Fuse (8)**  
Spare.
- **Free (9)**

**MAIN FUSE LAYOUT  
(BATTERY COMPARTMENT)**

- **20A Fuse (10)**  
From battery to: ignition switch, fuse (2), helmet compartment light, cooling fan, permanent dashboard power supply.
- **30A Fuse (11)**  
From battery to: voltage regulator, fuse (3), fuse (5).
- **30A Fuse (12)**  
Spare.

# ELECTRIC COMPONENTRY POSITIONS

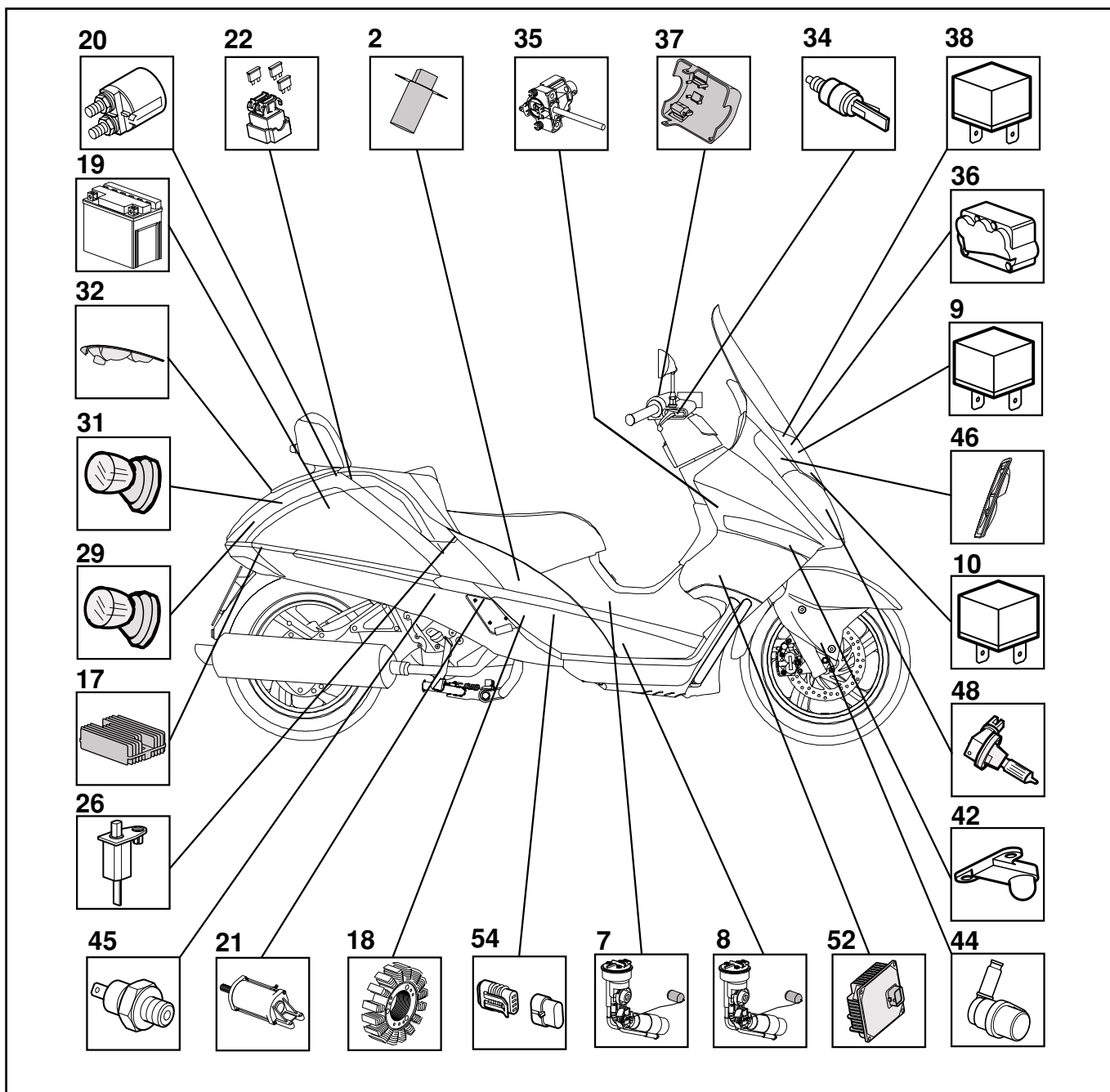


## Key

- |  |                                    |
|--|------------------------------------|
| 3) Stepper motor                                 | 28) Radio power supply             |
| 4) Coil  | 30) Left rear direction indicator  |
| 5) Spark plug                                    | 31) Parking/brake lamps            |
| 6) Fuel injector                                 | 33) Rear stop switch               |
| 11) Side stand switch                            | 39) Left dimmer switch             |
| 13) Throttle sensor                              | 40) Horn                           |
| 14) Engine air thermistor                        | 43) Dashboard                      |
| 15) Engine/dashboard H <sub>2</sub> O thermistor | 47) Left front direction indicator |
| 16) Fan  | 49) Highbeam bulbs                 |
| 23) Current socket                               | 50) Parking light bulb             |
| 24) Secondary fuses                              | 51) Headlight                      |
| 25) Storage compartment light                    | 53) Left taillight                 |
| 27) License plate lamp                           | 55) Brake lights relay             |
|  | 56) 3 brake lamps                  |



# ELECTRIC COMPONENTRY POSITIONS



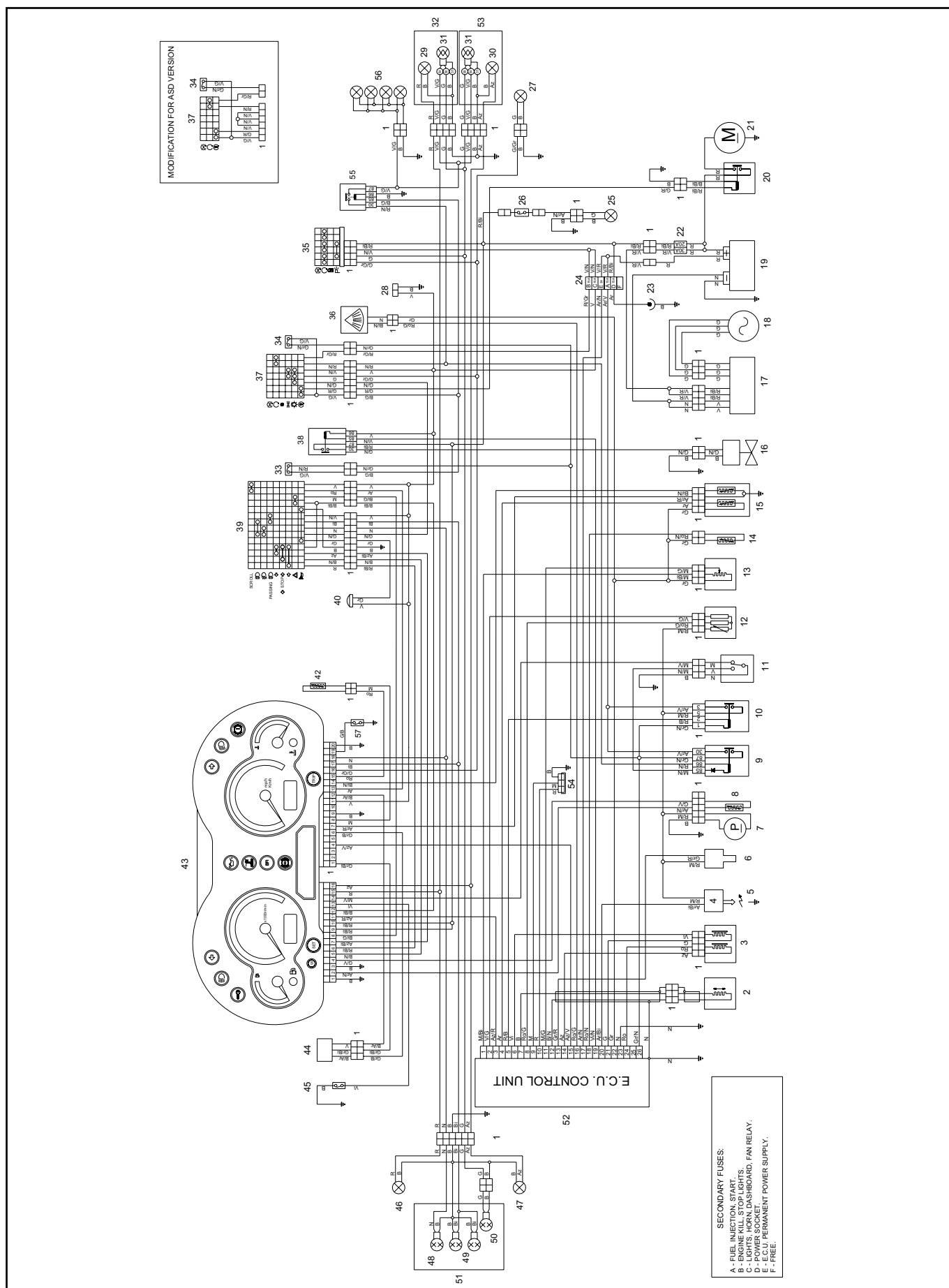
## Key

- 2) rpm sensor
- 7) Fuel pump
- 8) Fuel level probe
- 9) Main injection relay (with diode)
- 10) Secondary injection relay
- 17) Voltage regulator
- 18) Flywheel
- 19) Battery
- 20) Starter relay
- 21) Starter motor
- 22) Main fuses
- 26) Storage compartment light switch
- 29) Right rear direction indicator

- 31) Parking/brake lamps
- 32) Right taillight
- 34) Front stop switch
- 35) Key selector switch
- 36) Overturn sensor
- 37) Right dimmer switch
- 38) Fan relay
- 42) Dashboard air thermistor T
- 44) Speed sensor
- 45) Oil pressure sensor
- 46) Right front direction indicator
- 48) Headlight bulb
- 52) E.C.U. control unit
- 54) Socket for diagnostics



# WIRING DIAGRAM SCOOTER ATLANTIC 500 CC



**Wiring diagram legend**

- 1) Multiple connectors
- 2) rpm sensor
- 3) Stepper motor
- 4) Coil
- 5) Spark plug
- 6) Fuel injector
- 7) Fuel pump
- 8) Fuel level probe
- 9) Main injection relay (with diode)
- 10) Secondary injection relay
- 11) Side stand switch
- 12) Lambda probe (not available)
- 13) Throttle sensor
- 14) Engine air thermistor
- 15) Engine/dashboard H<sub>2</sub>O thermistor
- 16) Fan
- 17) Voltage regulator
- 18) Flywheel
- 19) Battery
- 20) Starter relay
- 21) Starter motor
- 22) Main fuses
- 23) Current socket
- 24) Secondary fuses
- 25) Storage compartment light
- 26) Storage compartment light switch
- 27) License plate lamp
- 28) Radio power supply
- 29) Right rear direction indicator
- 30) Left rear direction indicator
- 31) Parking/brake lamps
- 32) Right taillight
- 33) Rear stop switch
- 34) Front stop switch
- 35) Key selector switch
- 36) Overturn sensor
- 37) Right dimmer switch
- 38) Fan relay
- 39) Left dimmer switch
- 40) Horn
- 42) Dashboard air thermistor T
- 43) Dashboard
- 44) Speed sensor
- 45) Oil pressure sensor
- 46) Right front direction indicator
- 47) Left front direction indicator
- 48) Headlight bulb
- 49) Highbeam bulbs
- 50) Parking light bulb
- 51) Headlight
- 52) E.C.U. Control unit
- 53) Left taillight
- 54) Socket for diagnostics
- 55) Brake lights relay
- 56) 3 brake lamps
- 57) Hand brake switch (not standard)

**WIRE COLOR**

- Ar** orange  
**Az** light blue  
**B** blue  
**Bi** white  
**G** yellow  
**Gr** grey  
**M** brown  
**N** black  
**R** red  
**V** green  
**Vi** purple  
**Ro** pink



Cycle parts

7

## BODYWORK

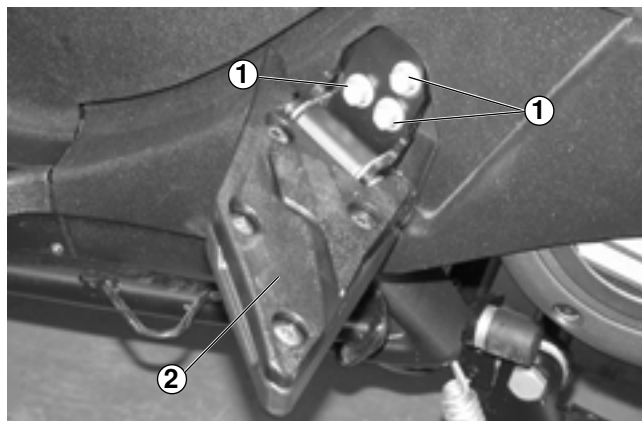
### REMOVING THE PASSENGER FOOTBOARDS

Place the motorcycle on the center stand.

#### ⚠ CAUTION

**Proceed with care.**

Unscrew and remove the 3 screws (1).  
Remove the passenger footboard (2).



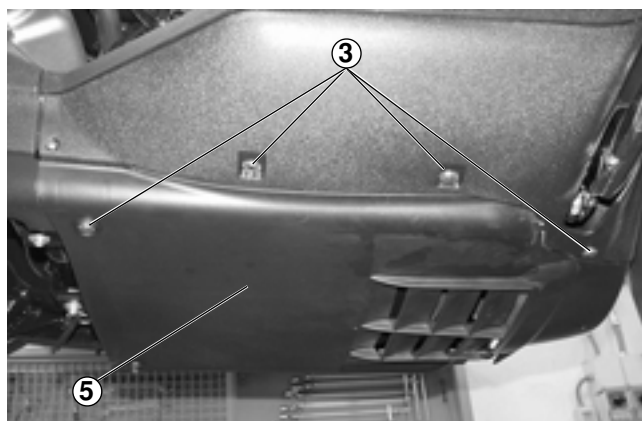
### REMOVING THE BOTTOM GUARD

Place the motorcycle on the center stand.

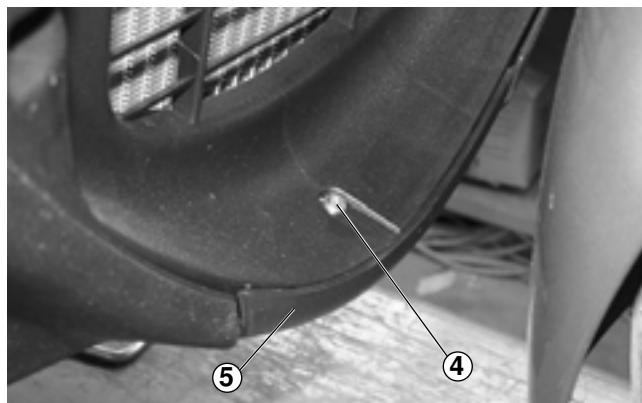
#### ⚠ CAUTION

**Proceed with care. Do not damage the tabs and/or corresponding tab slots. Handle painted parts carefully, without scraping or damaging them.**

Unscrew and remove the four screws (3) on the right and the four screws on the left.  
Remove the breather pipe from the expansion tank.



Unscrew and remove the screw (4) on the sprag behind the front wheel.  
Remove the bottom guard (5), supporting it to prevent it from falling.



### LOCKING/RELEASING THE SADDLE

Insert the key (1) in the ignition switch (2).  
Press and turn the ignition key (1) counter-clockwise.  
The pneumatic piston keeps the saddle (3) raised and lights the saddle compartment.  
To lock the saddle, lower and press (without forcing), until the lock clicks shut.

#### ⚠ WARNING

**Before riding, make sure that the saddle is firmly fastened in place.**



## REMOVING THE SADDLE

Place the motorcycle on the center stand.  
Lift the saddle (4), see (UNLOCKING/LOCKING THE SADDLE).

### ⚠ CAUTION

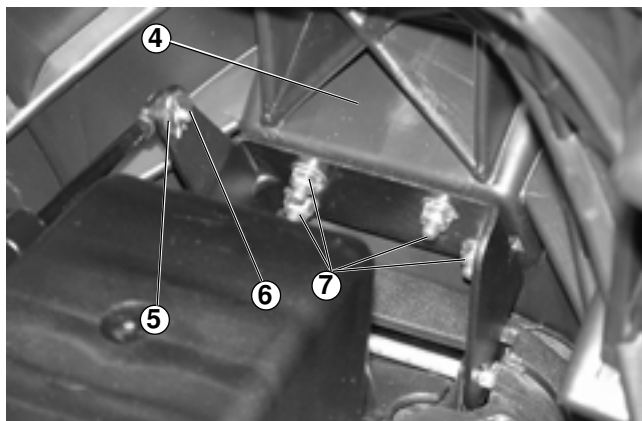
**Proceed with care.**

Use suitable pincers to slide out the clip (5).

### ⚠ CAUTION

**Keep the saddle raised to prevent it from falling freely.**

Slide out the pin (6).  
Unscrew and remove the four nuts (7).  
Remove the saddle (4).



7

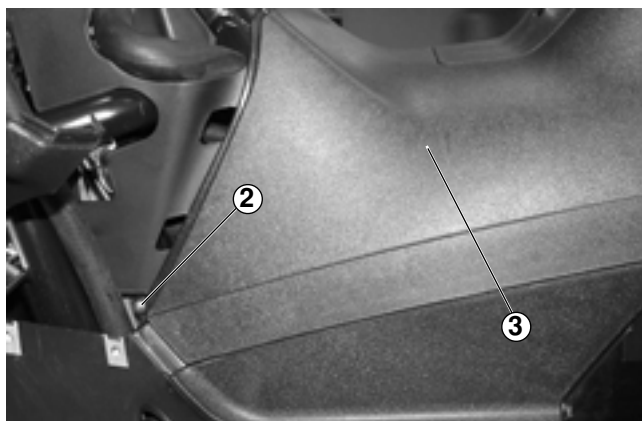
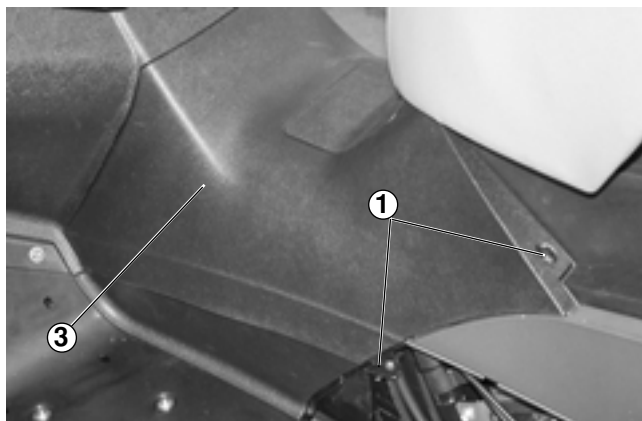
## REMOVING THE CENTRAL TUNNEL

Place the motorcycle on the center stand.  
Remove the saddle, see (UNLOCKING/LOCKING THE SADDLE).  
Remove the left and right inspection covers, see (REMOVING THE LEFT AND RIGHT INSPECTION COVERS).  
Remove the leg shield, see (REMOVING THE LEG SHIELD).

### ⚠ CAUTION

**Proceed with care. Do not damage the tabs and/or corresponding tab slots. Handle painted parts carefully, without scraping or damaging them.**

Unscrew and remove the two screws (1) on the right and left sides.  
Unscrew and remove the screw (2) on the right and left sides.  
Remove the central tunnel (3).



## REMOVING THE RIGHT AND LEFT INSPECTION COVERS

Place the motorcycle on the center stand.  
Remove the right or left mat (1) by lifting it with your hands.

Unscrew and remove the screw (2).

### ⚠ CAUTION

**Proceed with care.**

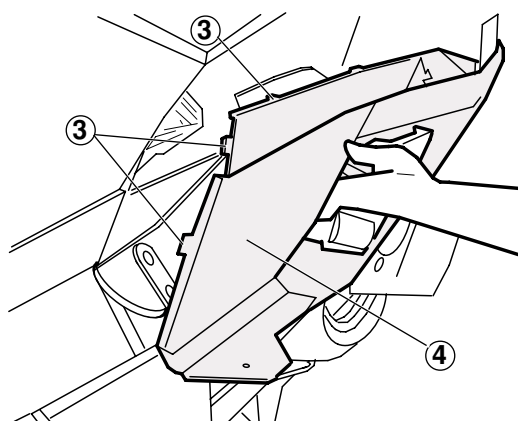
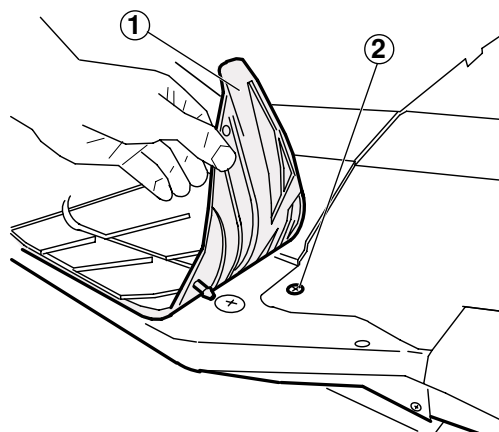
**Do not damage the tabs (3) and/or the slots in which they fit.**

**Handle the plastic and painted components with care to avoid scraping or damaging them.**

Use a screwdriver to force up the bottom of the inspection cover (4), until it leaves its seat.

### ⚠ CAUTION

**When reassembling, insert the tabs correctly in their slots.**



## REMOVING THE LEG SHIELD

Place the motorcycle on the center stand.

### ⚠ CAUTION

**Proceed with care. Do not damage the tabs and/or corresponding tab slots. Handle painted parts carefully, without scraping or damaging them.**

Remove the rubber footrest cover by lifting it off manually.

Unscrew and remove the three screws (1).

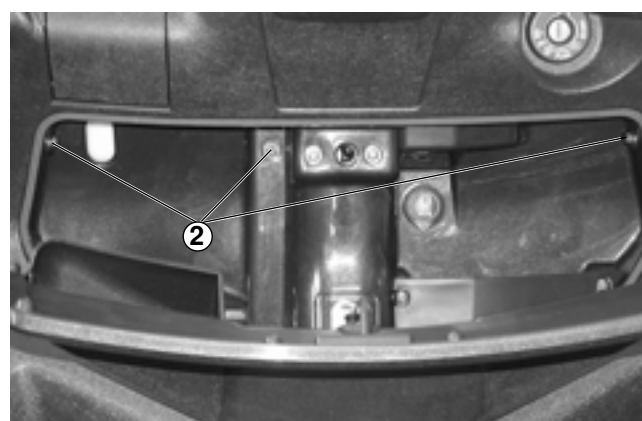
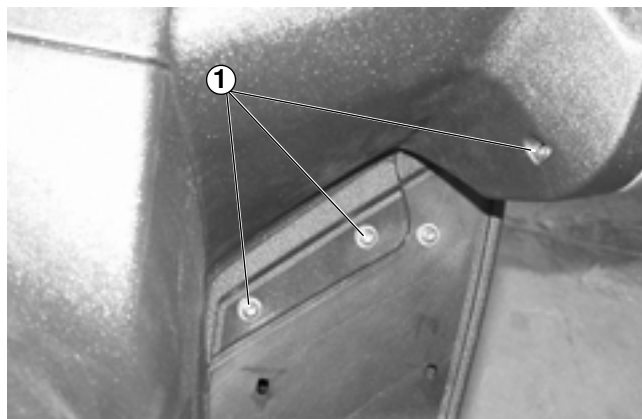
Open the storage compartment, see (STORAGE COMPARTMENT).

Unscrew and remove the three screws (2).

### ⚠ CAUTION

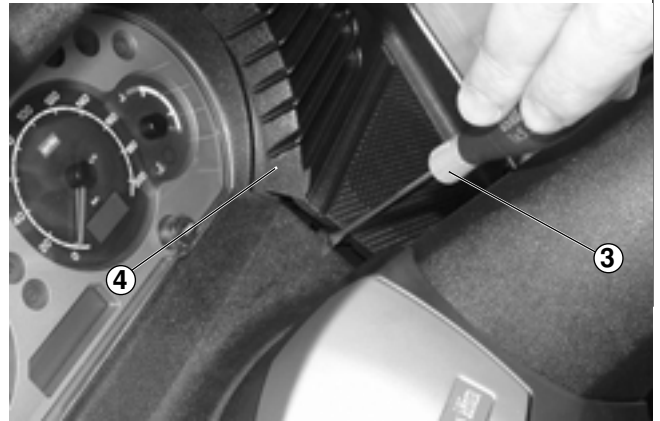
**Proceed with care.**

**Do not nick the plastic.**

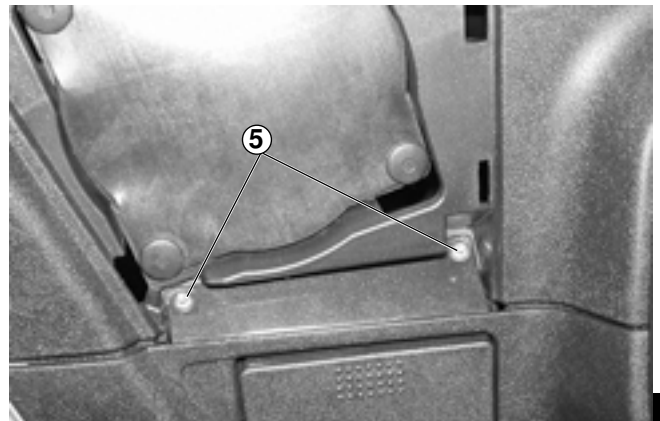




Using a flathead screwdriver (3), prize the speaker cover (4) away from its seat, as shown in the figure. Remove the speaker cover (4).



Unscrew and remove the two screws (5).



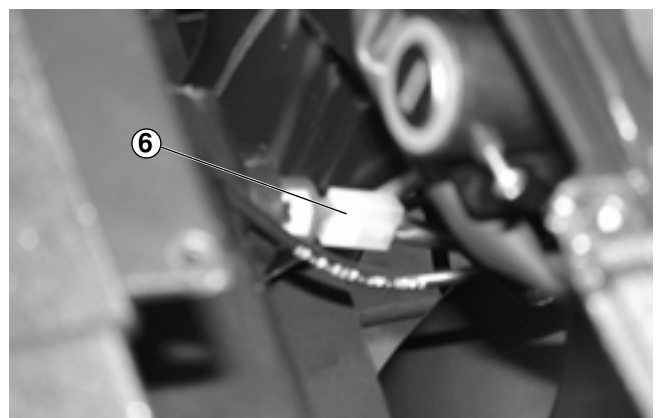
**⚠ CAUTION**

**Proceed with care. Do not damage the tabs and/or corresponding tab slots. Handle painted parts carefully, without scraping or damaging them.**

Using a flathead screwdriver (3) along the perimeter of the leg shield, prize it away from its slots.

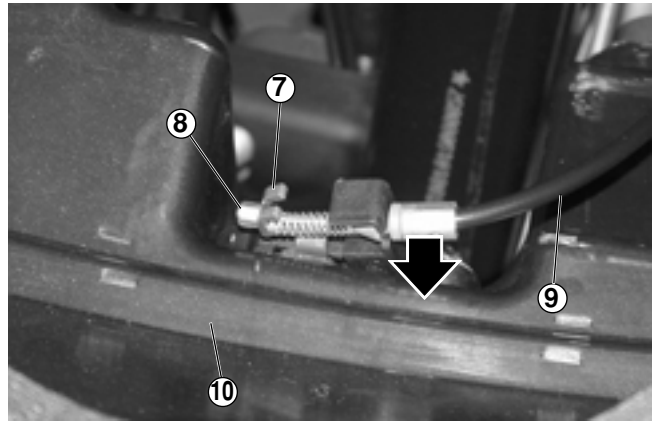


Once the leg shield is free of all slots, pull it away gently in order to be able to disconnect the electric connection (6) from the 180 W power socket inside the storage compartment.





Pull the tabs (7) towards the cable (9), in order to lift and free the cable end (8). Pull the cable (9) in the direction shown by the arrow in order to free the leg shield from the storage compartment closure. Remove the leg shield (10).



## STORAGE COMPARTMENT

Thanks to the storage compartment, you do not need to carry inconvenient items with you whenever you park your vehicle.

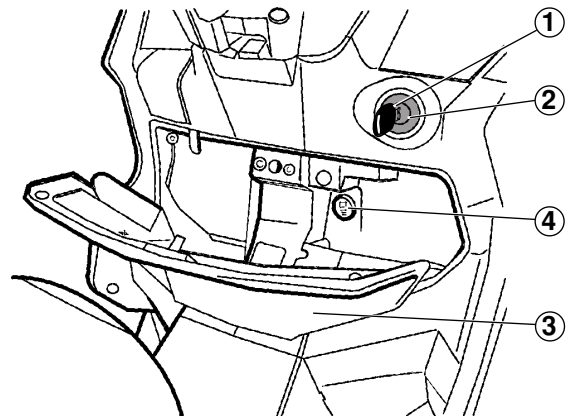
Insert the key (1) in the ignition switch (2).

Press and turn the key clockwise.

The glove compartment door opens automatically.

Inside the storage compartment is a 12V power socket (3).

The power socket may be used to power appliances requiring no more than 180 W (cellular phone, flashlight, etc.).



### ▲ CAUTION

**Extended use of the socket with the vehicle stopped and engine off may partly drain the battery.**

## REMOVING THE FRONT MUDGUARD

Place the motorcycle on the center stand.

### ▲ CAUTION

**Proceed with care. Do not damage the tabs and/or corresponding tab slots. Handle painted parts carefully, without scraping or damaging them.**

Unscrew and remove the screw (7).

Unscrew and remove the two screws (5).

Remove the front mudguard (6) by sliding it out from the front of the vehicle.



## REMOVING THE PASSENGER HANDLES

Place the motorcycle on the center stand.

### ⚠ CAUTION

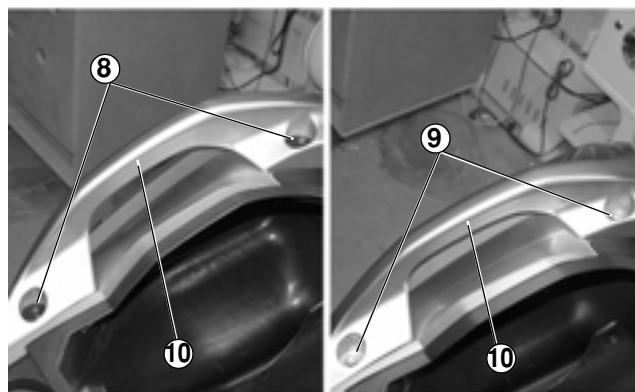
**Proceed with care. Do not damage the tabs and/or corresponding tab slots. Handle painted parts carefully, without scraping or damaging them.**

Lift the saddle, see (UNLOCKING/LOCKING THE SADDLE).

Using a small flathead screwdriver, prize off the two rubber caps (8).

Unscrew and remove the two screws (9).

Remove the passenger handle (10) by turning it inwards towards the vehicle.



## REMOVING THE WHOLE SIDE PANELS

Remove the inspection covers, see (REMOVING THE LEFT AND RIGHT INSPECTION COVERS).

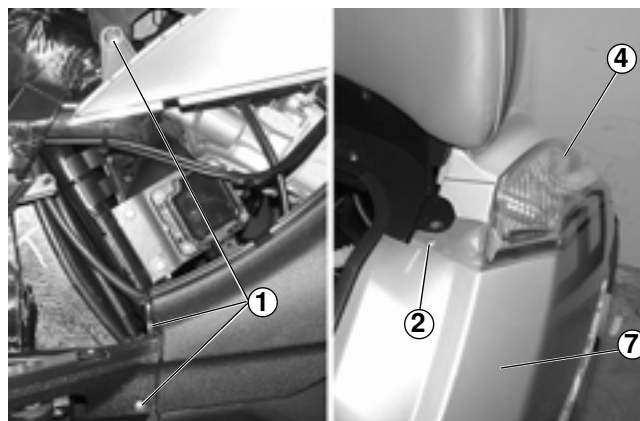
Remove the passenger footboards, see (REMOVING THE PASSENGER FOOTBOARDS).

Lift the saddle, see (UNLOCKING/LOCKING THE SADDLE).

Place the vehicle on the center stand.

Unscrew and remove the 3 screws (1).

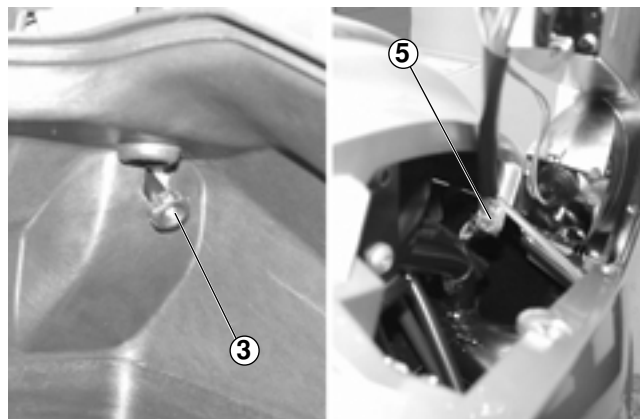
Unscrew and remove the screw (2).



From the inside of the helmet compartment, loosen and remove the fastening knob (3) of the light assembly (4).

Gently lift the rear light assembly (4) away from the side and disconnect the electric connection (5).

Remove the rear light assembly (4).

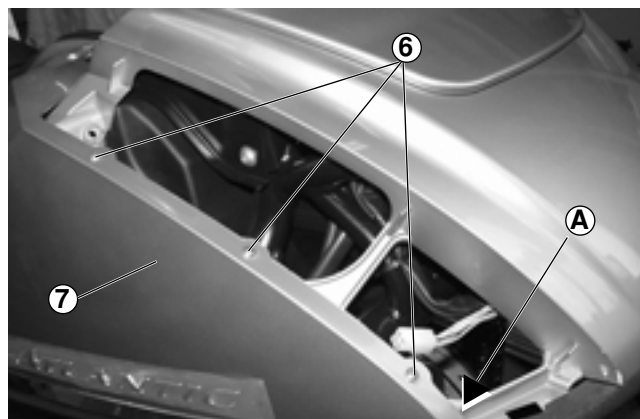


Unscrew and remove the 3 screws (6).

Open the side stand (for left side panel only).

Remove the license plate band screw (A).

Remove the side panel (7), complete with chrome-plated strip, by turning it outwards from the vehicle.



## REMOVING THE CHROME-PLATED SIDE PANEL STRIP

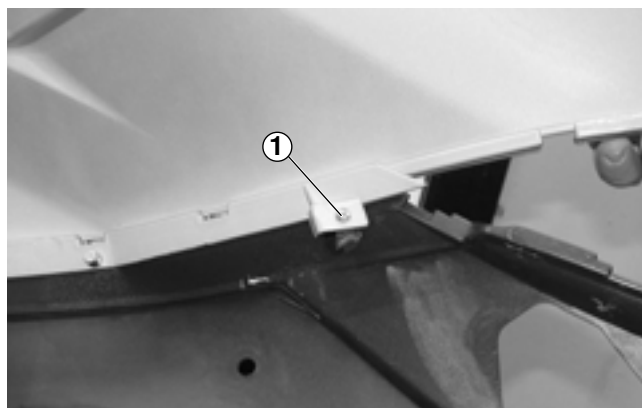
Remove the complete side panel, see (REMOVING THE WHOLE SIDE PANELS).

### ▲ CAUTION

**Proceed with care. Do not damage the tabs and/or corresponding tab slots. Handle painted parts carefully, without scraping or damaging them.**

Unscrew and remove the screw (1), located inside the whole side panel.

Remove the chrome-plated strip by gently bending it in the center.



## SEPARATING THE SIDE PANELS

Remove the whole side panels, see (REMOVING THE WHOLE SIDE PANELS).

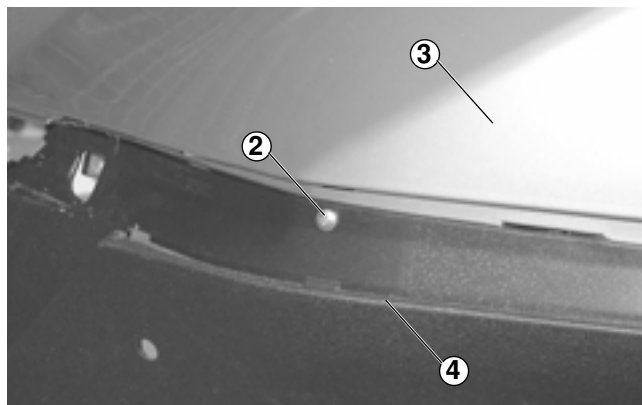
Remove the chrome-plated strip on the sides, see (REMOVING THE CHROME-PLATED SIDE PANEL STRIP).

### ▲ CAUTION

**Proceed with care. Do not damage the tabs and/or corresponding tab slots. Handle painted parts carefully, without scraping or damaging them.**

Unscrew and remove the screw (2), below the chrome-plated strip.

Separate the two side panel screws (3) and (4), by allowing them to slide along each other but being careful not to damage the tabs.

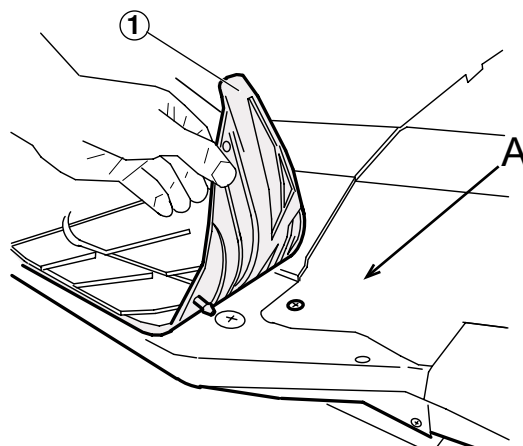


## REMOVING THE FOOTREST

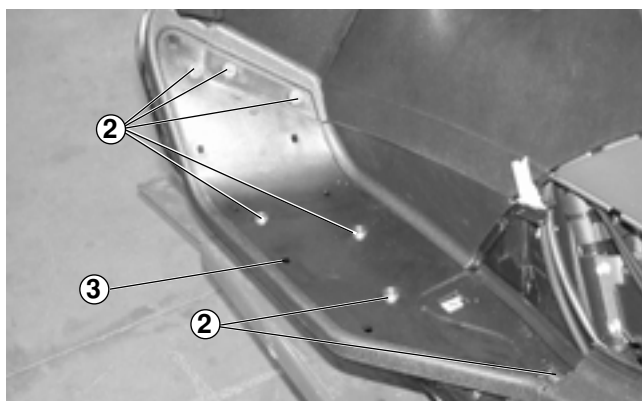
Place the motorcycle on the center stand.  
Remove the rubber footrest cover (1) by lifting it off manually.  
Remove the sparkplug access cover (A).

### ▲ CAUTION

**Proceed with care. Do not damage the tabs and/or corresponding tab slots. Handle painted parts carefully, without scraping or damaging them.**



Unscrew and remove the 7 screws (2).  
Remove the foot rests (3).



7

## REMOVING THE SPLASH GUARD

Place the motorcycle on the center stand.

### ▲ CAUTION

**Proceed with care. Do not damage the tabs and/or corresponding tab slots. Handle painted parts carefully, without scraping or damaging them.**

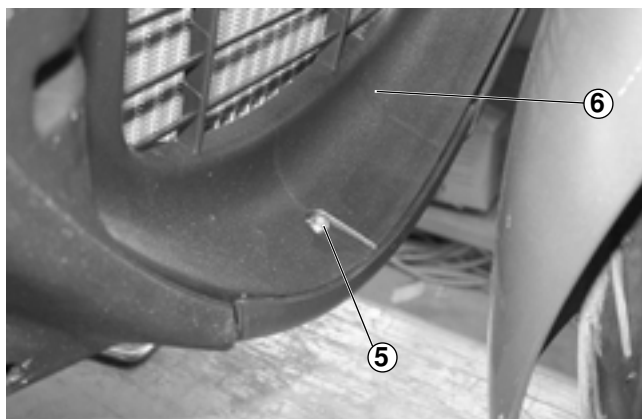
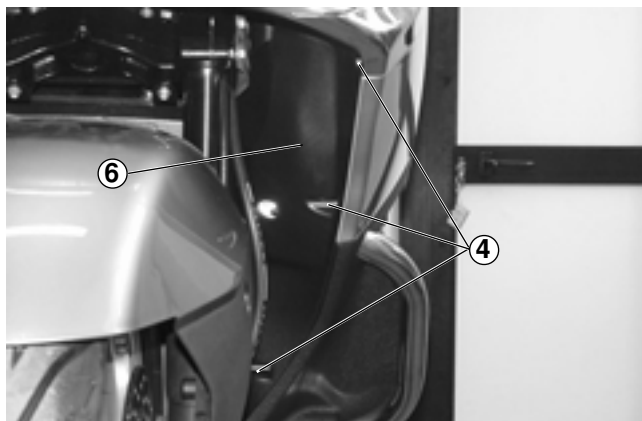
Remove the front mudguard, see (REMOVING THE FRONT MUDGUARD).

Remove the front wheel, see (REMOVING THE FRONT WHEEL).

Unscrew and remove the three screws (4) (on the left and right sides of the vehicle).

Unscrew and remove the screw (5).

Remove the splash guard (6) by sliding it downwards.



## REMOVING THE FRONT SHIELD

Remove the splash guard, see (REMOVING THE SPLASH GUARD).

Remove the leg shield, see (REMOVING THE LEG SHIELD).

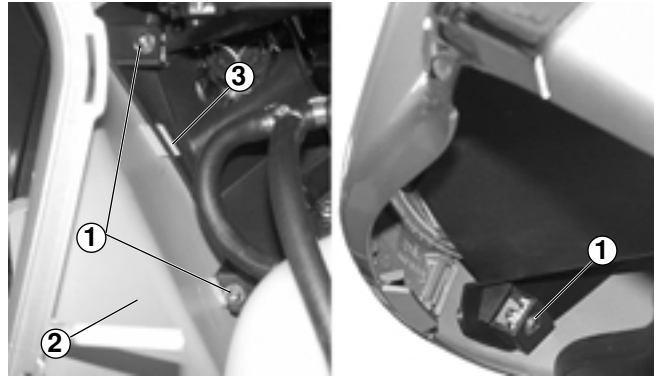
### ⚠ CAUTION

**Proceed with care. Do not damage the tabs and/or corresponding tab slots. Handle painted parts carefully, without scraping or damaging them.**

Unscrew and remove the 3 screws (1) (three on the right and three on the left).

Free the front shield (2) from its supports by prizing out its tabs (3) with a flathead screwdriver.

Remove the front shield (2), sliding it away from the front of the vehicle.



## REMOVING THE PASSENGER BACKREST

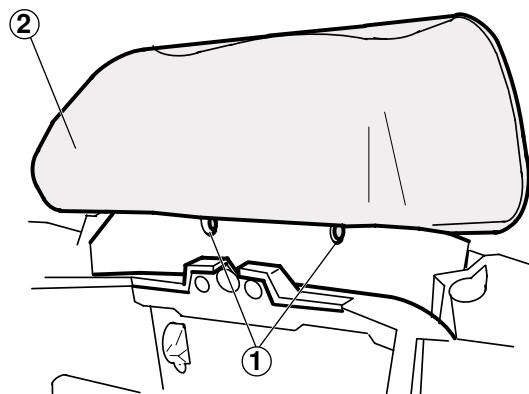
Lift the saddle, see (UNLOCKING/LOCKING THE SADDLE).

Loosen and remove the two screws (1) that fasten the backrest to the vehicle.

### ⚠ CAUTION

**Proceed with care when removing the backrest in order not to break the insertion tabs.**

Remove the backrest (2) by pulling it upwards.

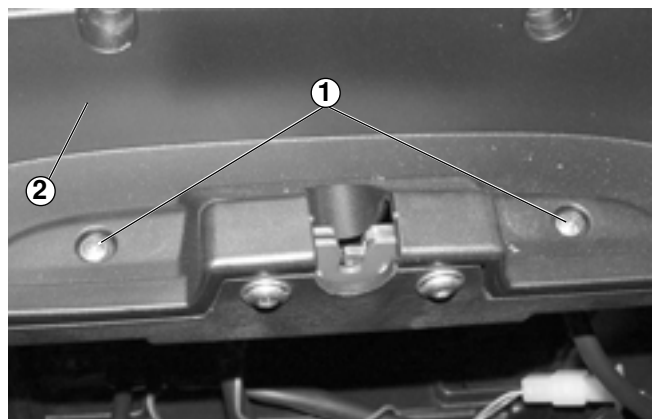


## REMOVING BACKREST PLASTIC PARTS

Remove the passenger backrest, see (REMOVING THE PASSENGER BACKREST).

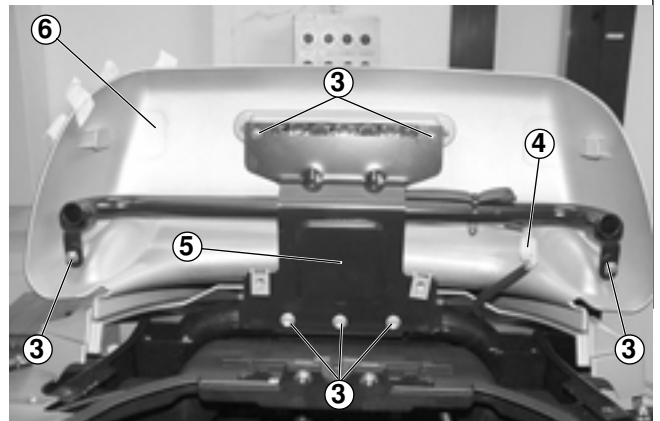
Unscrew and remove the two screws (1).

Remove the cover (2) that closes the saddle.





Unscrew and remove the 7 screws (3).  
Disconnect the electric connection (4).  
Remove the support arch (5).



Lift and remove the plastic part (6) of the backrest.

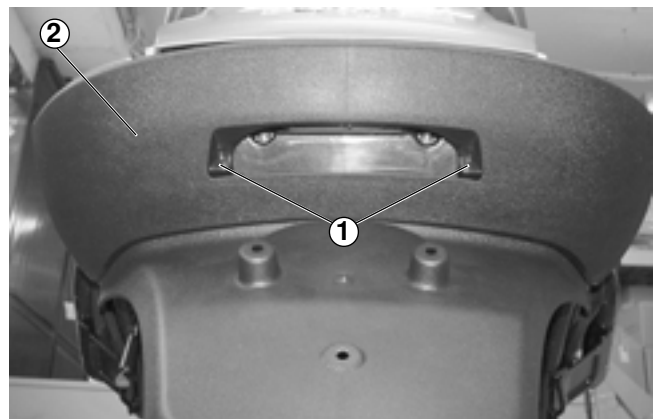
## REMOVING THE REAR MUDGUARD

Place the motorcycle on the center stand.

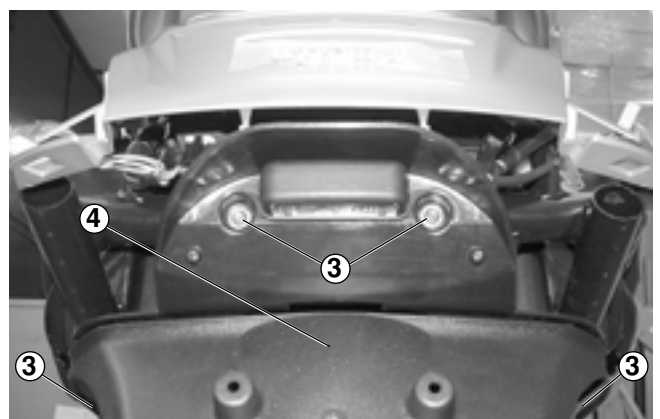
### ⚠ CAUTION

**Proceed with care. Do not damage the tabs and/or corresponding tab slots. Handle painted parts carefully, without scraping or damaging them.**

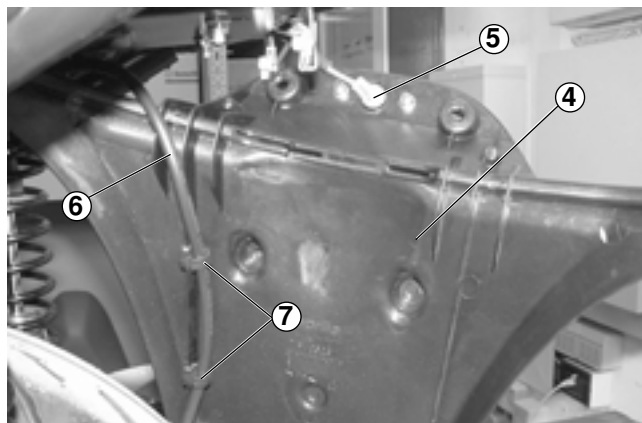
Unscrew and remove the two screws (1).  
Remove the license plate light cover.  
Pull off the plastic cover (2).  
Unscrew and remove the 4 screws (3).



Gently pull away the rear mudguard (4) while supporting it.

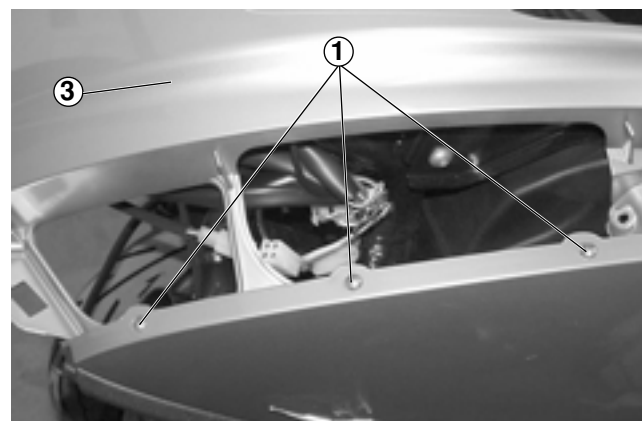


Still holding the rear mudguard, disconnect the license plate light bulb (5), slide out the battery bleeder pipe (6) from its guide clip (7).  
Remove the rear mudguard (4).

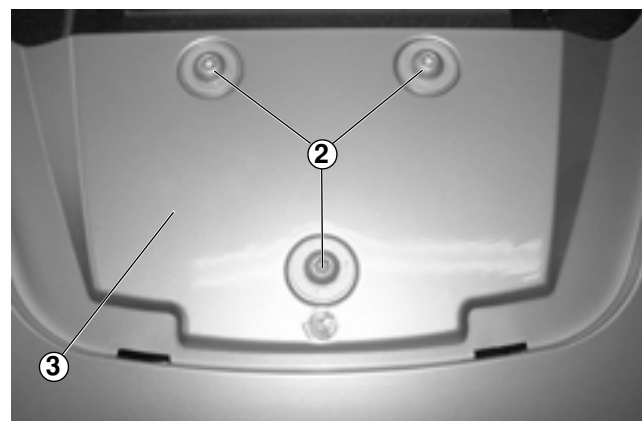


### REMOVING THE REAR PART OF THE FAIRING

Remove the plastic parts of the backrest, see (REMOVING THE PLASTIC PARTS OF THE BACKREST).  
Remove the rear mudguard, see (REMOVING THE REAR MUDGUARD).  
Remove the rear light assembly, see (REMOVING THE COMPLETE SIDE PANELS).  
Unscrew and remove the 3 screws (1).



Unscrew and remove the 3 screws (2) making sure to keep the relevant washers and bushings.  
Remove the rear part of the fairing by sliding it backwards (3).



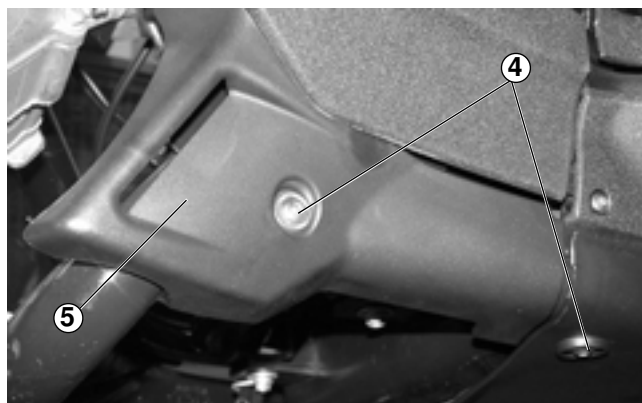
### REMOVING THE BOTTOM COVERS

Place the motorcycle on the center stand.

#### ▲ CAUTION

**Proceed with care. Do not damage the tabs and/or corresponding tab slots. Handle painted parts carefully, without scraping or damaging them.**

Unscrew and remove the two screws (4).  
Remove the bottom cover (5).



**REMOVING THE FOOTREST SUPPORT AND  
BOTTOM SPLASH GUARD**

Remove the leg shield, see (REMOVING THE LEG SHIELD).

Remove the central tunnel, see (REMOVING THE CENTRAL TUNNEL).

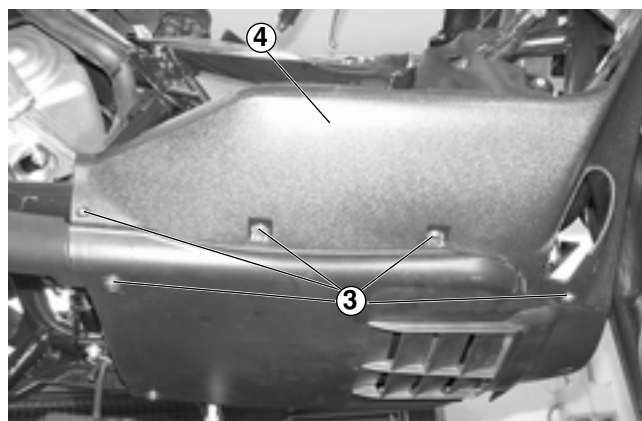
Unscrew and remove the two screws (1).

Remove the chrome-plated protection pipe (2).



Unscrew and remove the 5 screws (3).

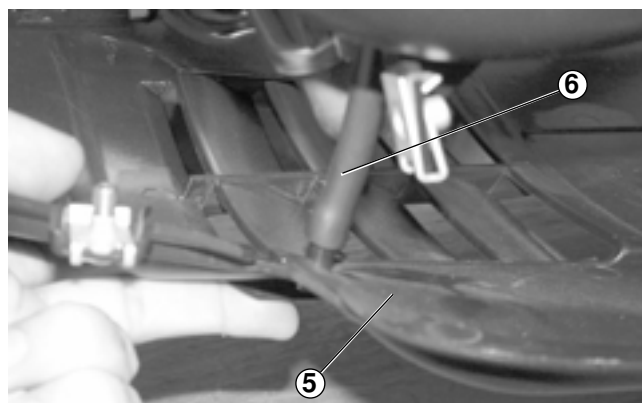
Remove the footrest support (4).



Support the bottom splash guard (5).

Disconnect the bleeder pipe (6) from the coolant tank.

Remove the bottom splash guard (5).





## REMOVING THE FRONT HOOD

Place the motorcycle on the center stand.  
Unscrew and remove the two screws (1).

### ▲ CAUTION

Proceed with care.

Do not damage the tabs and/or corresponding tab slots.

Handle painted parts carefully, without scraping or damaging them.

Unscrew and remove the two screws (2).

### ▲ CAUTION

When disassembling, be careful to keep the clips installed on the tabs from falling out.

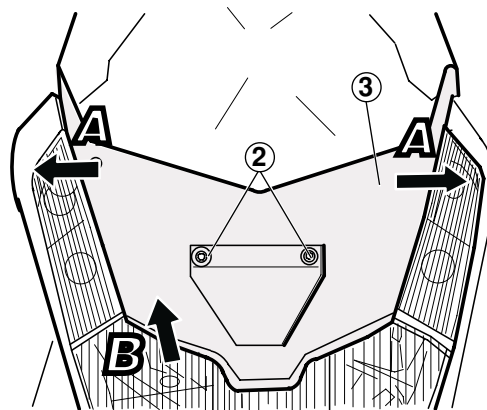
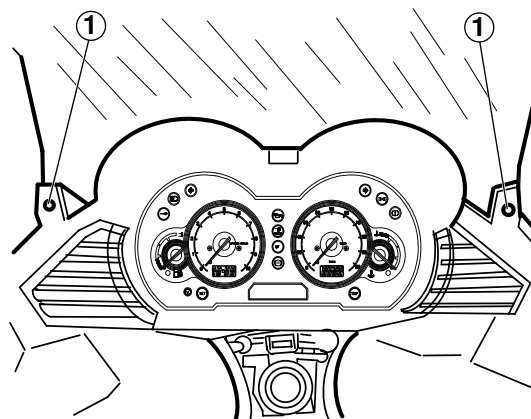
Slightly spread the fins of the front hood as shown by the arrows "A", to release the tabs from the front fairing.

Lift the bottom of the hood slightly as shown by the arrow "B".

Pull the front hood (3) carefully to remove.

### ▲ CAUTION

When reassembling, insert the tabs correctly in their slots with the corresponding clips.

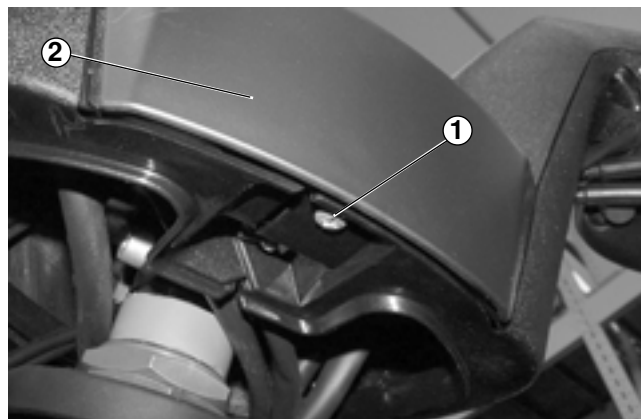


## REMOVING THE TOP HANDLEBAR COVER

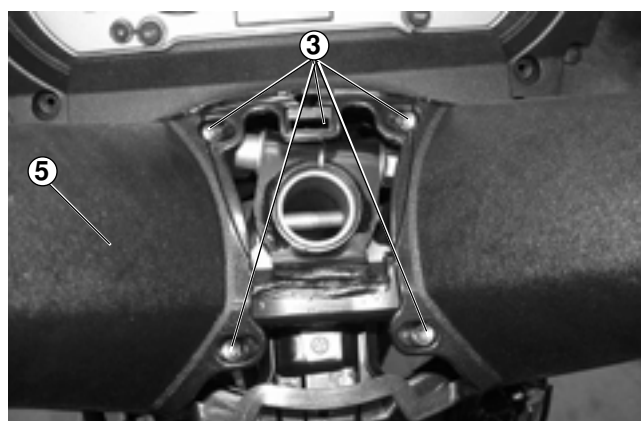
Remove the leg shield, see (REMOVING THE LEG SHIELD).

Unscrew and remove the screw (1).

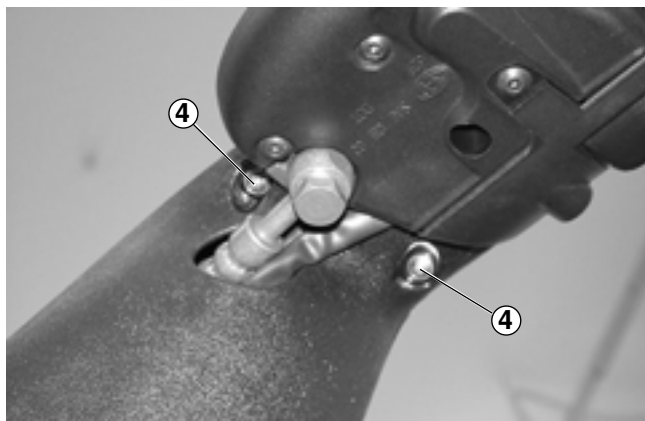
Lift and remove the cover (2).



Unscrew and remove the 5 screws (3).

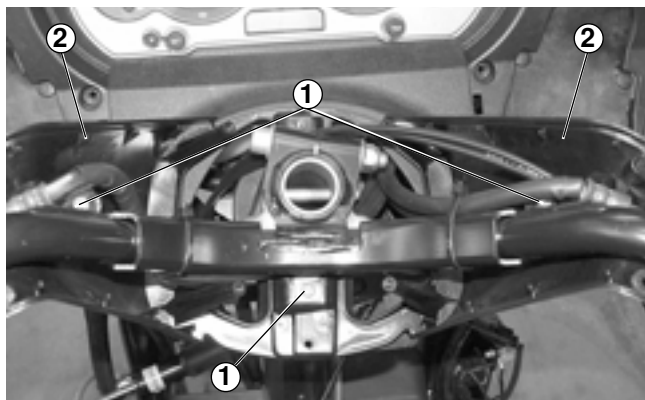


Unscrew and remove the two screws (4) on the left and right of the vehicle.  
Remove the top handlebar cover (5).



### REMOVING THE BOTTOM HANDLEBAR COVER

Remove the top handlebar cover, see (REMOVING THE TOP HANDLEBAR COVER).  
Unscrew and remove the 3 screws (1).  
Separate the plastic parts (2) by pulling them outwards.



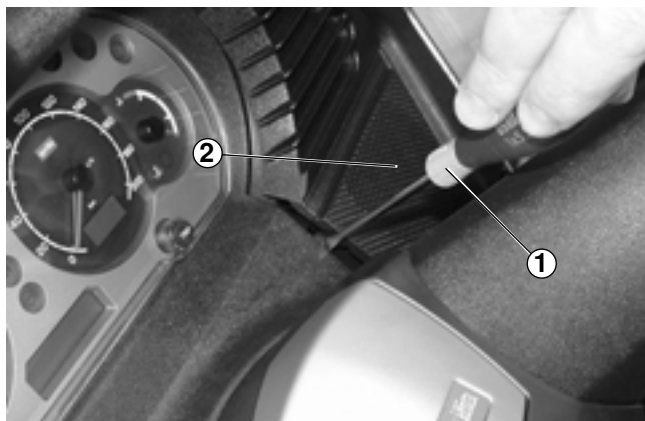
### REMOVING THE COMPLETE DASHBOARD

Place the motorcycle on the center stand.

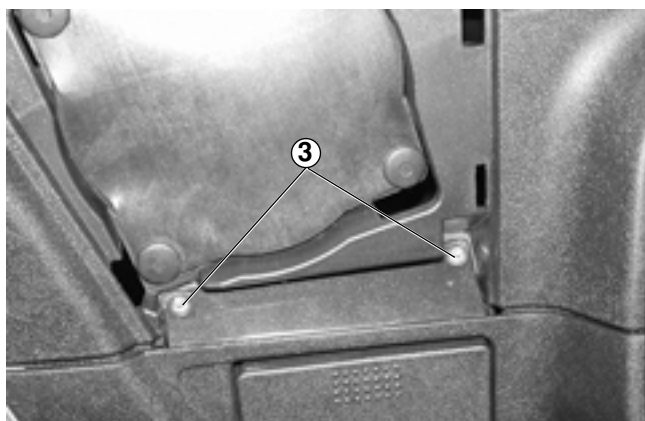
#### ⚠ CAUTION

**Proceed with care. Do not damage the tabs and/or corresponding tab slots. Handle painted parts carefully, without scraping or damaging them.**

Use a flathead screwdriver (1) to prize the speaker cover (2) away from its seat, as shown in the figure.  
Remove the speaker cover (2).



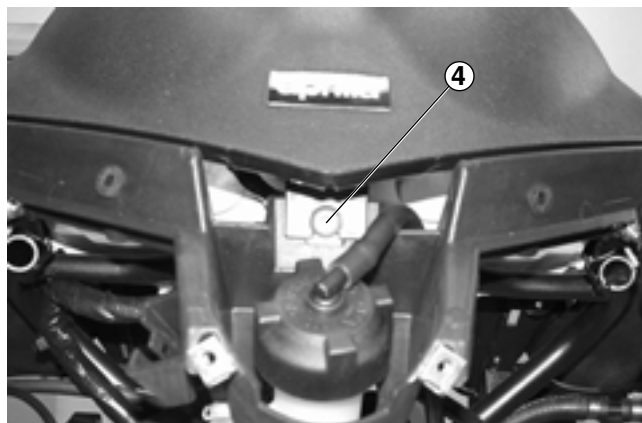
Unscrew and remove the two screws (3).



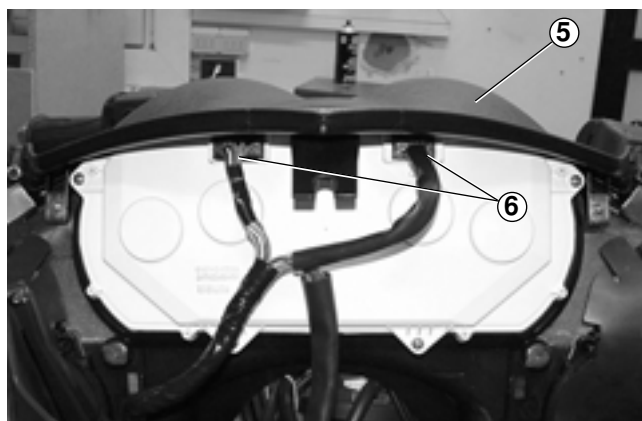
Remove the front hood, see (REMOVING THE FRONT HOOD).

Remove the windshield, see (REMOVING THE WINDSHIELD).

Unscrew and remove the screw (4).



Lift away the complete dashboard (5), disconnect the electric connections (6) directly from the dashboard. Remove the complete dashboard (5).



## REMOVING THE FRONT FAIRING

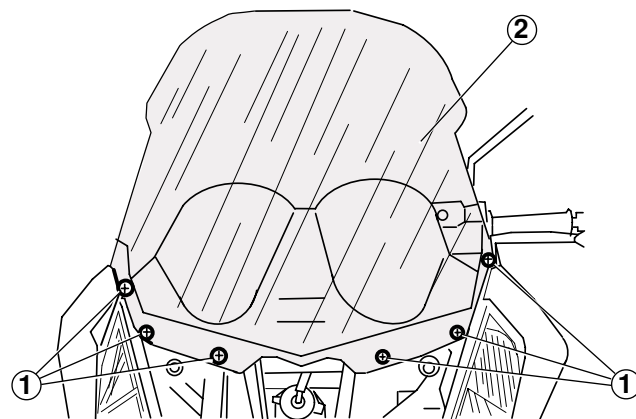
Carefully read (MAINTENANCE).

Place the motorcycle on the center stand.

Removing the front hood, see (REMOVING THE FRONT HOOD).

Loosen and remove the six screws (1) fastening the front fairing to the vehicle.

Remove the front fairing (2).

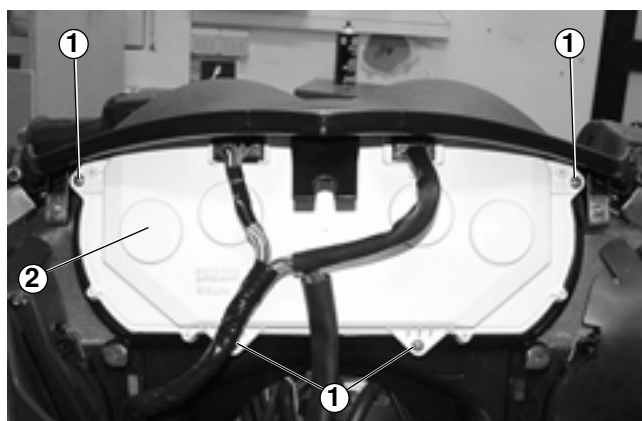


## REMOVING THE DASHBOARD PANEL

Remove the complete dashboard, see (REMOVING THE COMPLETE DASHBOARD).

Unscrew and remove the 4 screws (1).

Remove the dashboard panel (2).



**REMOVING THE COMPLETE LIGHT UNIT**

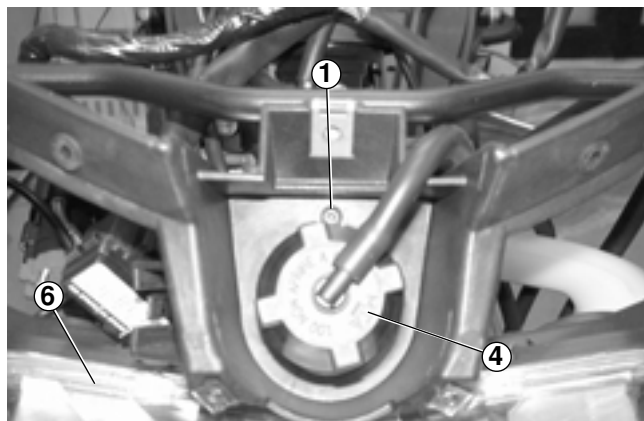
Remove the front hood, see (REMOVING THE FRONT HOOD).

Remove the windshield, see (REMOVING THE WINDSHIELD).

Remove the front shield, see (REMOVING THE FRONT SHIELD).

Remove the complete dashboard, see (REMOVING THE COMPLETE DASHBOARD).

Unscrew and remove the screw (1).

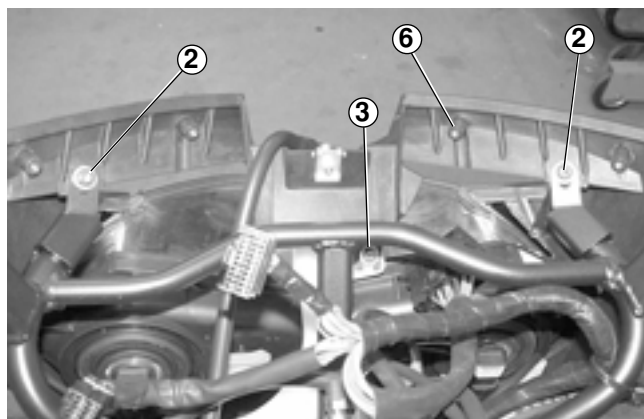


Unscrew and remove the two screws (2) being sure to keep the relevant self-locking nut.

Unscrew and remove the screw (3).

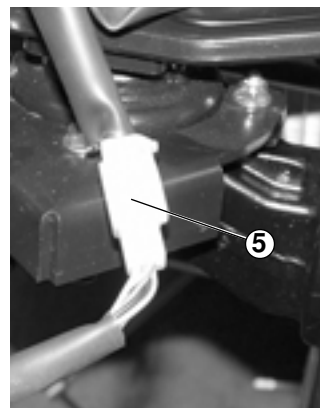
Unscrew the coolant filler cap (4).

Unscrew the two screws of the bottom arch (above the fork).



Disconnect the electric connection (5).

Remove the complete light assembly (6).





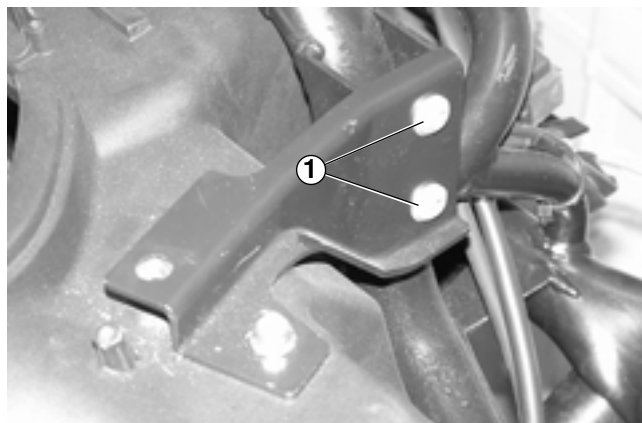
## REMOVING THE HELMET COMPARTMENT

Remove the saddle, see (REMOVING THE SADDLE).  
Remove the central tunnel, see (REMOVING THE CENTRAL TUNNEL).

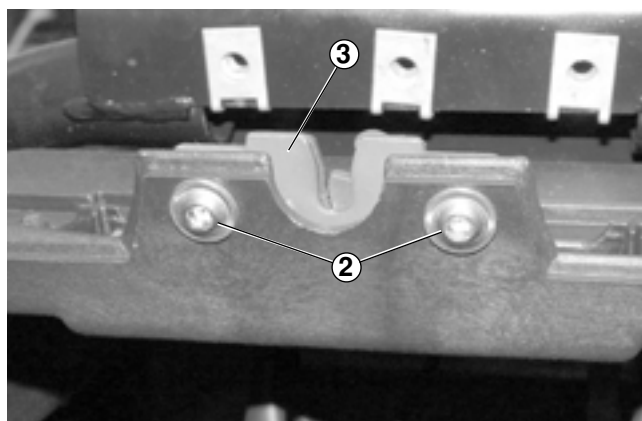
Remove the left and right side panels (see REMOVING THE WHOLE SIDE PANELS).

Unscrew and remove the two screws (1), making sure to keep the relevant washers.

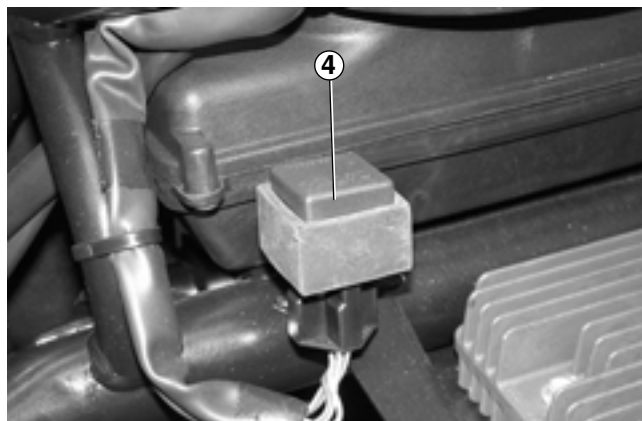
(Repeat this operation on the right side also)



Unscrew and remove the two screws (2) that fasten the saddle lock (3) to the helmet compartment and free the lock from the compartment.



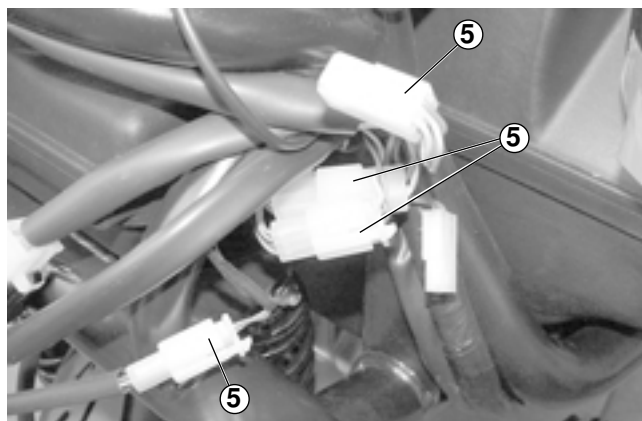
Slide out the relay (4) by pulling it upwards.



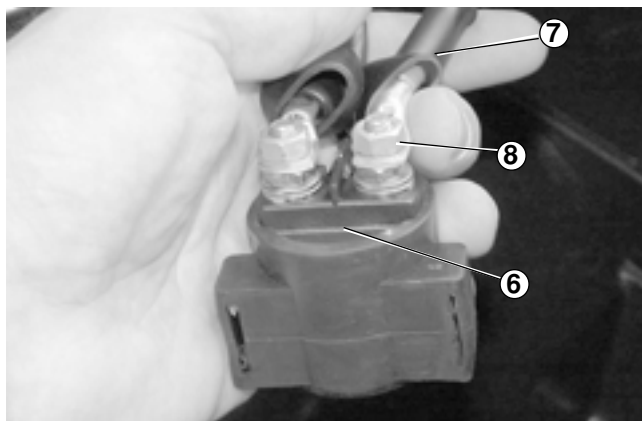
Remove the battery cover, see (REMOVING THE BATTERY).

Remove the battery, see (REMOVING THE BATTERY).

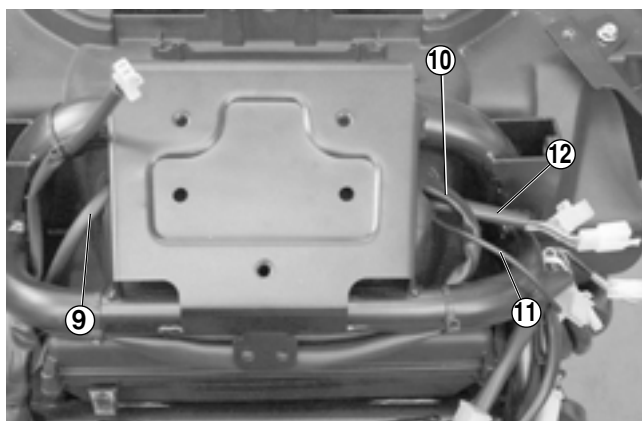
Disconnect the electric connections (5).



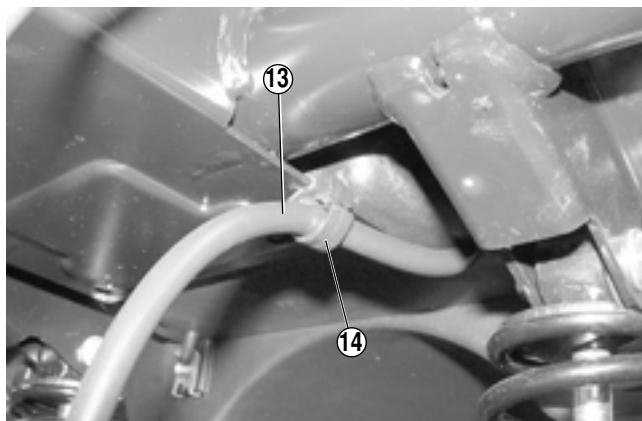
Slide the starter relay (6) out from its seat in the battery compartment.  
Use a hand to support the relay and slide off the rubber protection cap (7).  
Unscrew and remove the nut (8).



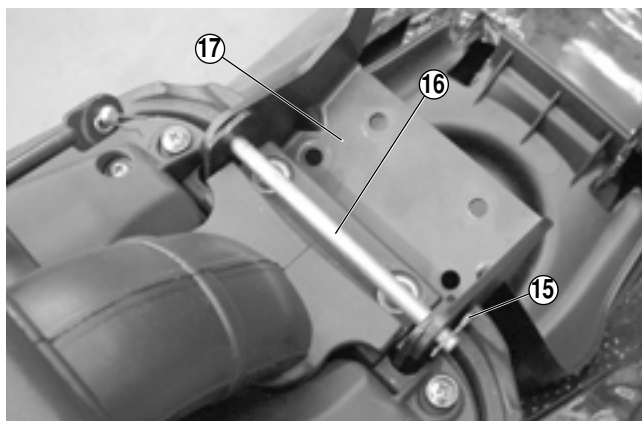
Slide the cables from the helmet compartment out to the rear.  
Slide out the starter relay cable (9).  
Slide out the battery cable (10).  
Slide out the ground cable (11).  
Slide out the fuse wire (12).



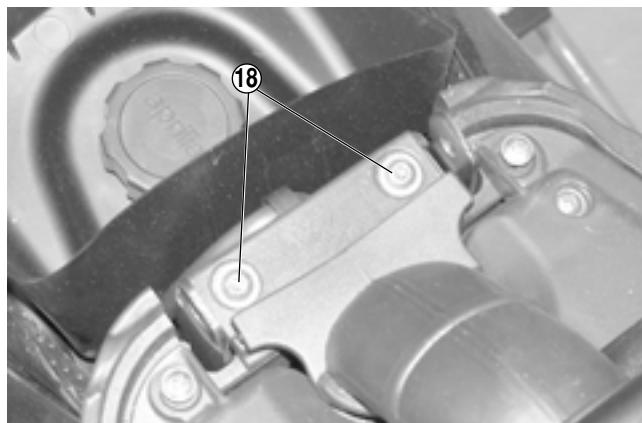
Disconnect the battery bleeder pipe (13) from its clip (14).



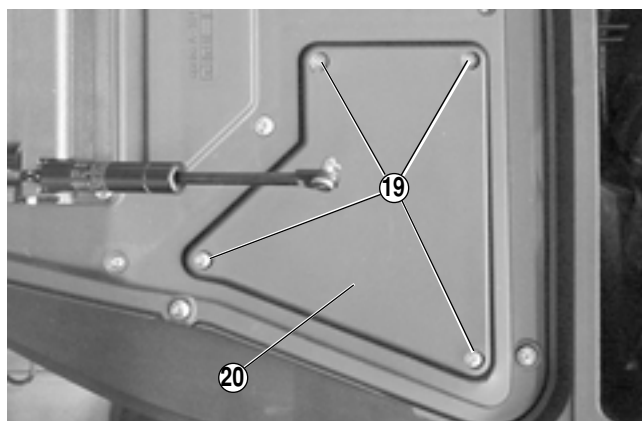
Remove the clip (15) and slide out the pin (16).  
Remove the saddle hinge (17).



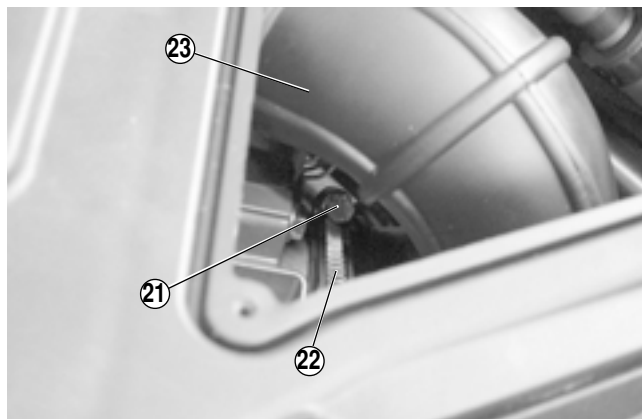
Unscrew and remove the two screws (18).



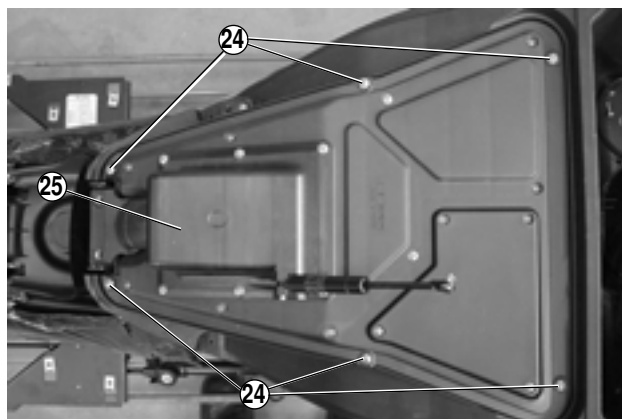
Unscrew and remove the four screws (19) of the carburetor cover (20).  
Remove the carburetor cover (20).



Use the screw (21) to loosen the clamp (22) and slide out the fuel suction hose (23) by pulling it outwards.



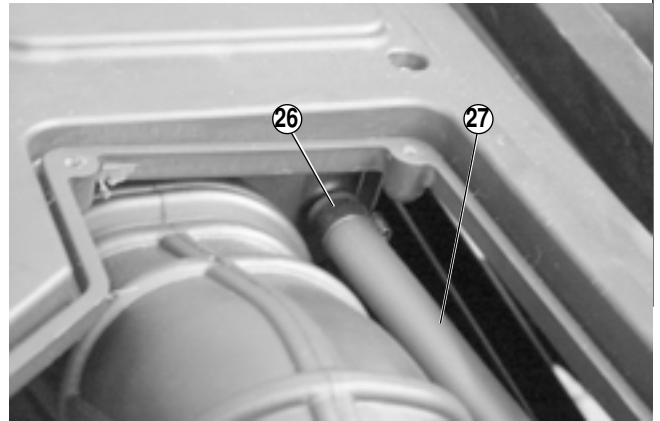
Unscrew and remove the six screws (24) of the filter case (25).



**NOTE** Be sure to have prepared a new clamp to replace the old one.

Remove the hose clamp (26) and slide out the pipe (27).

Remove the engine cover (25) by lifting it upwards.



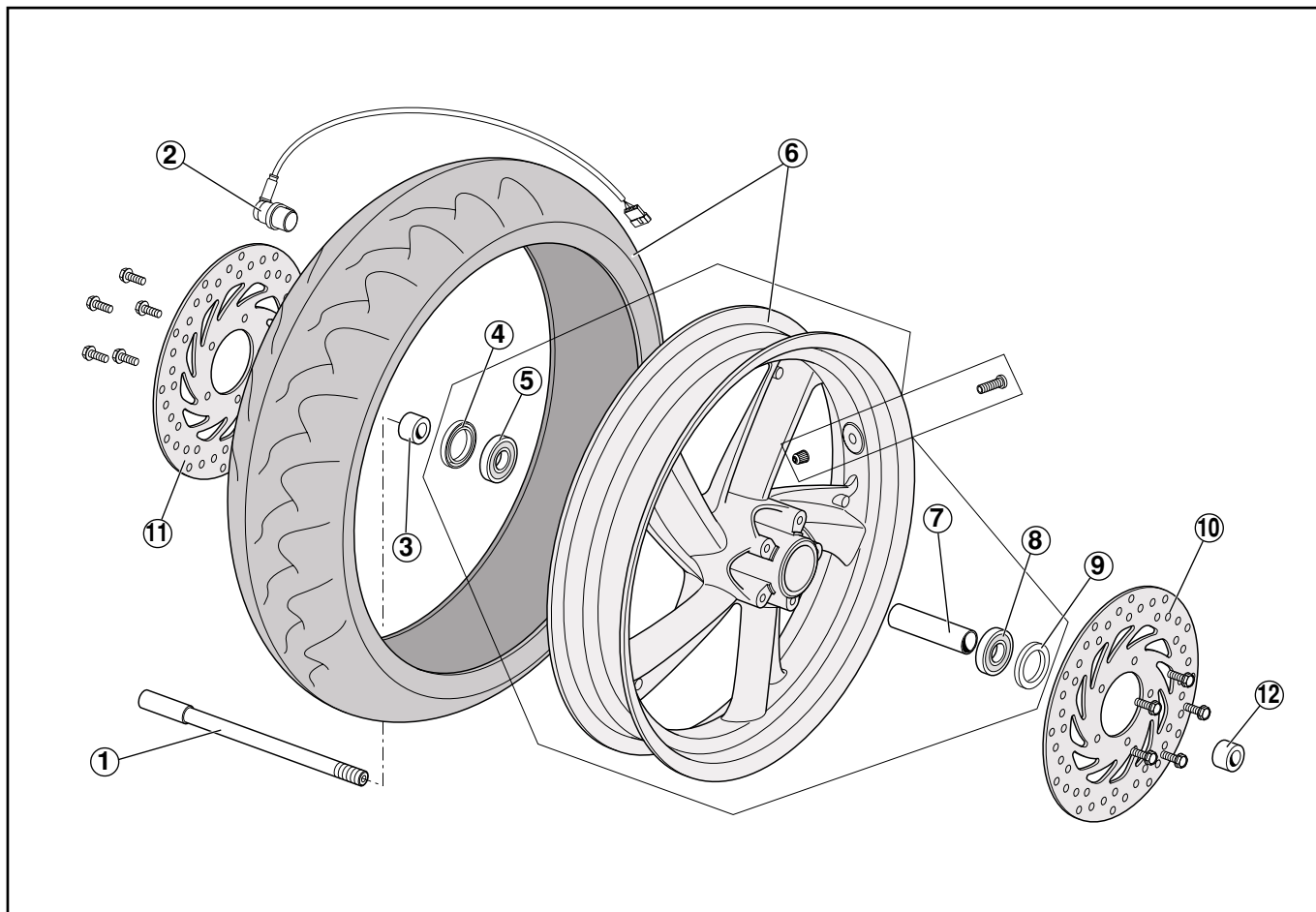
Disconnect the electric connection (28) of the helmet compartment light switch.

Remove the helmet compartment (29) by lifting the front section upwards and moving the whole block forwards.





## FRONT WHEEL



## KEY

- 1) Wheel pin
- 2) Km counter sensor
- 3) Right external spacer
- 4) Right oil seal
- 5) Right bearing
- 6) Wheel
- 7) Internal spacer
- 8) Left bearing
- 9) Left oil seal
- 10) Left brake disc
- 11) Right brake disc
- 12) Left external spacer

## REMOVING THE FRONT WHEEL

Read carefully (PRECAUTIONS AND GENERAL INFORMATION).

### ⚠ CAUTION

**Take care not to damage the brake hoses, disc and pads when removing/refitting the wheel.**

Place the motorcycle on the center stand.

### ⚠ WARNING

**Position a block or support under the motorcycle so that front wheel is free of the ground and that the motorcycle is stable and will not fall backward when the front wheel is removed.**

**NOTE** Perform the following operations on the right side of the vehicle also.

Unscrew and remove the two screws (1).  
Remove the brake calliper (2) by withdrawing it carefully.  
Loosen the screw (3).

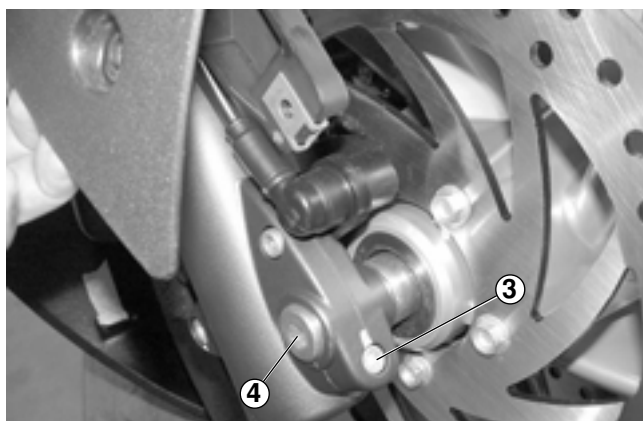
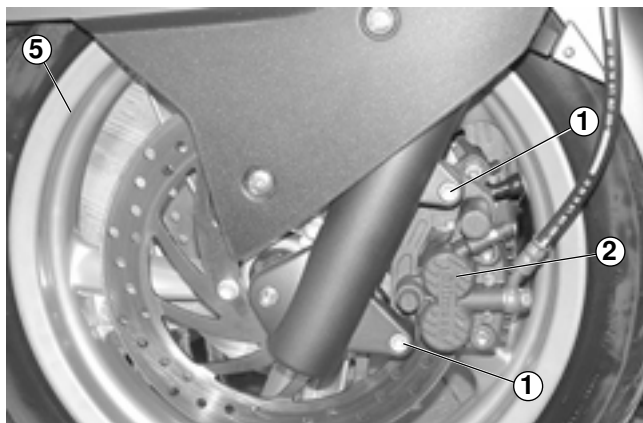
**NOTE** Observe the assembly order of the parts, washers and spacers, in order to be able to reassemble them correctly.

Remove the axle wheel (4).  
Hold the front wheel (5) and take out the axle (4) manually.  
Remove the wheel (5).  
Be sure to keep the left and right spacers.

### ⚠ WARNING

**Do not engage the front brake lever after removing the wheel; this may cause the caliper piston to leave its seat, allowing brake fluid to leak.**

For reassembly, see (REASSEMBLY).



## CHANGING THE BEARINGS

Read carefully (PRECAUTIONS AND GENERAL INFORMATION).

### ▲ CAUTION

**Each time they are disassembled the bearings must be checked and, if necessary, renewed.**

Clean both sides of the hub with a cloth.

### Removal

Work from the left side of the vehicle:

Insert a punch (not pointed) into the wheel hub and work on the right bearing inner ring (1), changing the contact points in rotation (90°) in order not to misalign the bearing.

Remove the right bearing (1).

Remove the spacer (2).

Work from the right side of the vehicle:

### ▲ CAUTION

**Keep the pad perpendicular to the bearing (aligned with the wheel axis) in order not to misalign or ruin the bearing.**

Insert a pad (diameter 0.59 in or 15 mm) into the wheel hub and rest it against the left bearing inner ring (3).

Hit the pad gently several times with a rubber hammer and remove the bearing.

### Refitting

Work from the right side of the vehicle:

Rest the bearing against the wheel hub.

### ▲ CAUTION

**Keep the pad perpendicular to the bearing (aligned with the wheel axis) in order not to misalign or ruin the bearing.**

Rest a pad (diameter 1.22 in or 31 mm) against the outer edge of the bearing.

Hit the pad gently several times with a rubber hammer and insert the right bearing (1) completely.

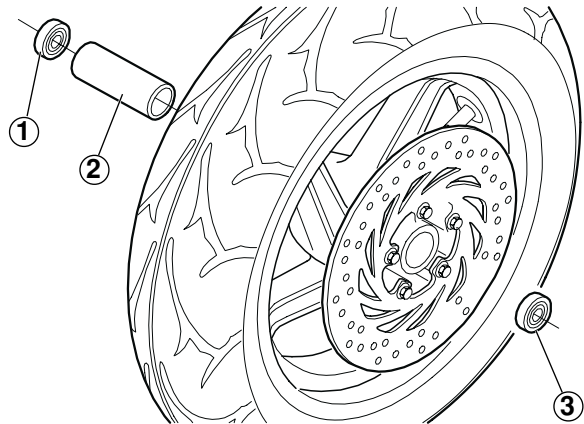
Insert the spacer (2).

Work from the left side of the vehicle:

Repeat the first three operations for the left bearing (3).

### ▲ WARNING

**Make sure that the bearings are centered compared to the wheel hub.**



## INSPECTION

**⚠ CAUTION**

Inspect the condition of all the components, especially those listed below.

**Bearings**

Turn the inner ring (1) by hand; it should rotate without blocking and/or making any noise.

There should be no axial play. Bearings that show signs of these problems must be replaced.

**⚠ CAUTION**

Apply grease to the balls (or rollers) at the side of each bearing, see (LUBRICANT CHART).

This operation is not required if the bearing is of the self-lubricating type.

**Front axle**

Using a dial indicator, check the radial runout of the pin.

If it exceeds limit values, replace the pin.

**Max. radial runout: 0.0098 in (0.25 mm)**

**⚠ CAUTION**

Apply grease to the pin (bearing contact point only), see (LUBRICANT CHART).

**Rim**

Using a dial indicator, determine that the radial and axial runout of the rim are within specification. Excessive runout is usually caused by worn or damaged bearings or a bent axle. If after checking these components, you determine the rim still does not meet specification, the rim must be replaced.

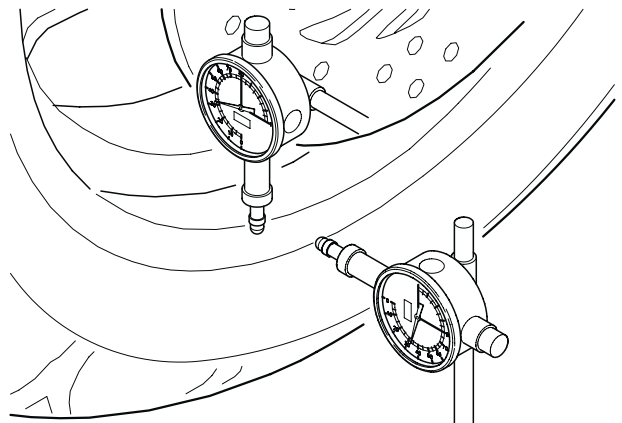
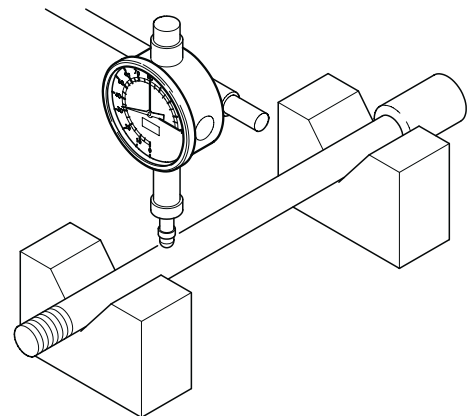
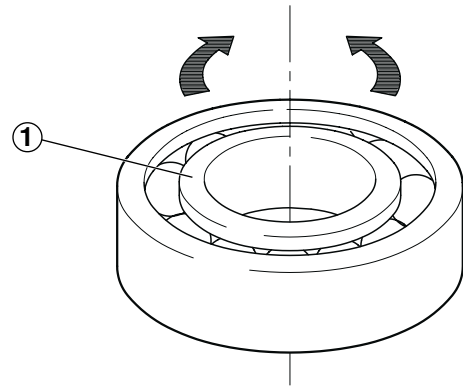
**Max. radial and axial runout: 0.078 in (2 mm)**

**Speedometer transmission**

Check that there are no signs of damage and/or excessive wear.

**Tires**

Check the condition of the tires, see (TIRES).



## REFITTING THE FRONT WHEEL

**▲ CAUTION**

**Be careful not to damage the brake lines, disc and pads when refitting.**

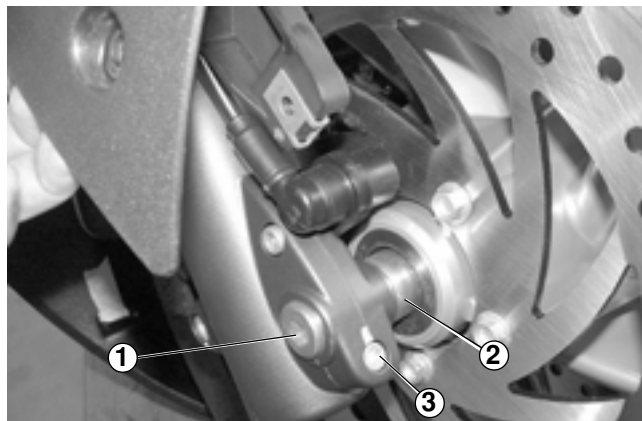
Position the wheel between the fork rods.

Insert the wheel pin (1) from the right side of the vehicle.

Insert the spacer (2) between the hub and the right fork rod.

Insert the spacer between the hub and the left fork rod.

Screw in and tighten the wheel pin (1).



**NOTE** Perform this operation from the right side of the vehicle also.

Refit the brake caliper (4) by sliding it carefully onto the brake disc.

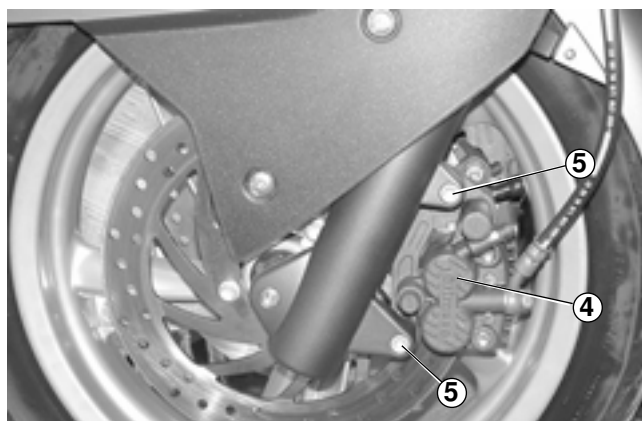
Screw in and tighten the two screws (5).

Apply the front brake lever and press on the handlebar repeatedly to move the fork downwards.

In this way, the fork rods will settle correctly.

Screw in and tighten the wheel pin clamp screw (1).

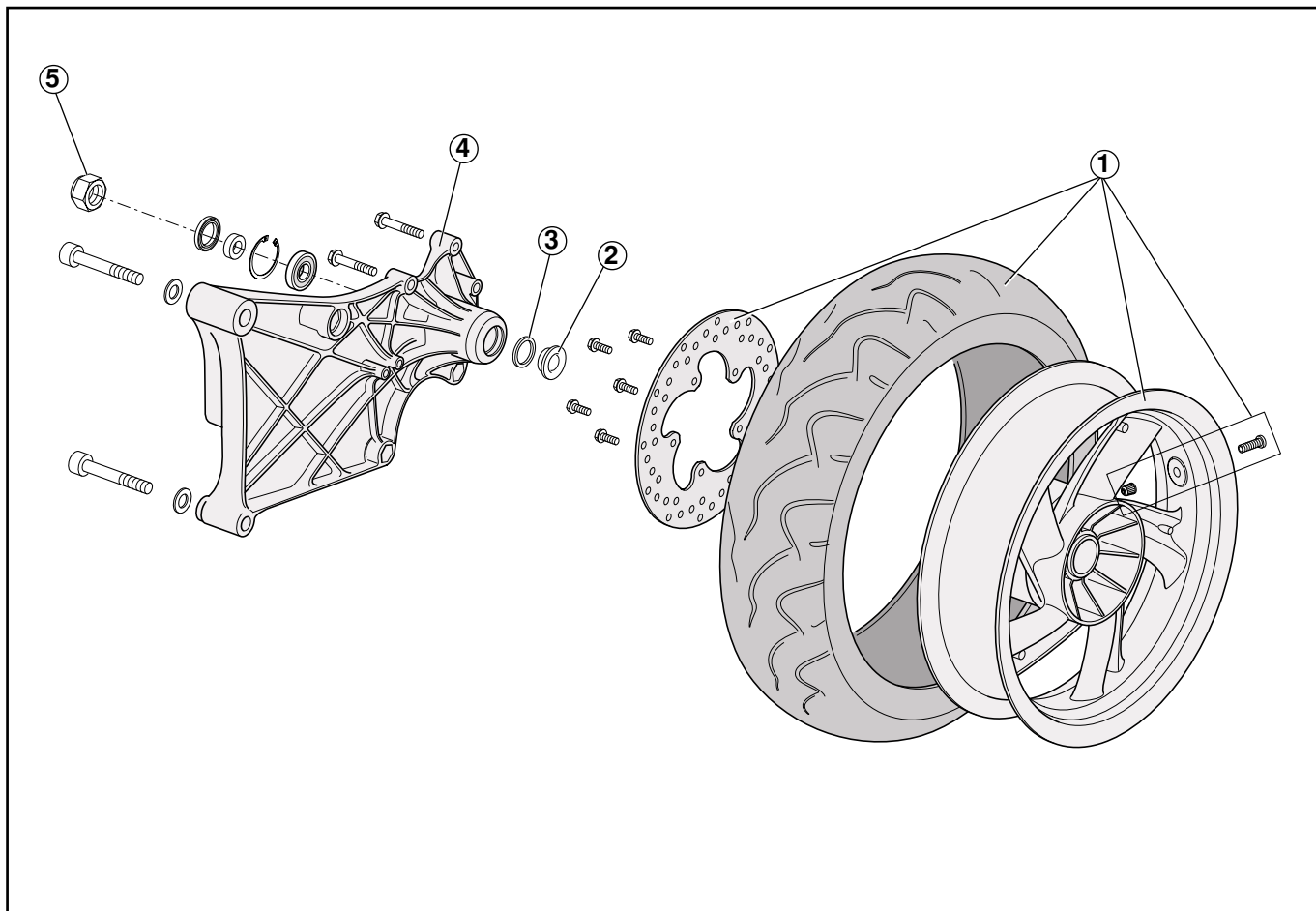
Screw in and tighten the screw (3).

**▲ CAUTION**

**After refitting, apply the front brake lever repeatedly to ensure that the brake system is working properly.**

Check that the wheel is centered and balanced, see (WHEELS/TIRES).

## REAR WHEEL



7

## KEY

- 1) Complete wheel
- 2) Spacer
- 3) Oil retainer
- 4) Brake caliper/exhaust support plate
- 5) Nut



## REMOVING THE REAR WHEEL

Read carefully (PRECAUTIONS AND GENERAL INFORMATION).

Place the motorcycle on the center stand.

### ⚠ WARNING

**Wait until the engine and exhaust muffler cool down completely.**

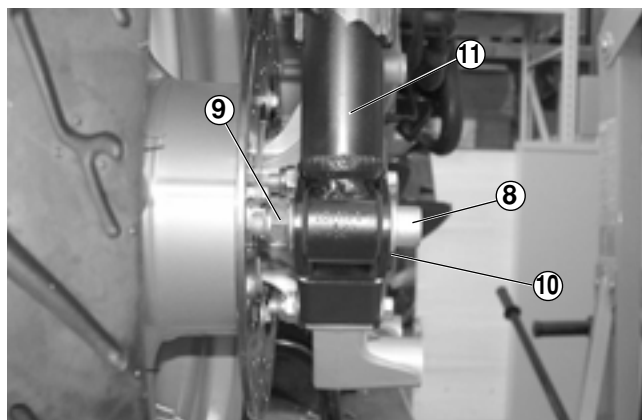
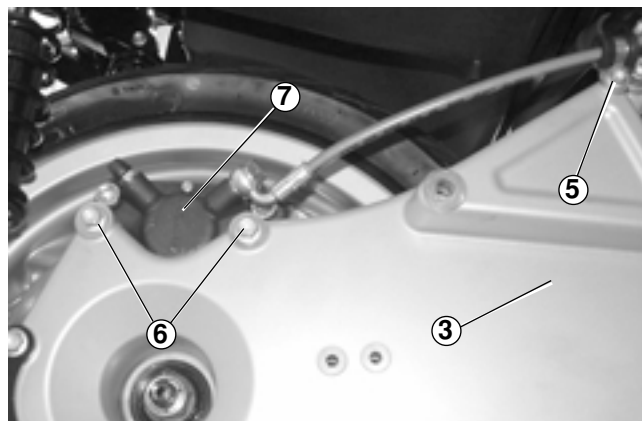
Remove the exhaust muffler, see (REMOVING THE EXHAUST MUFFLER).

Unscrew and remove the screw (5) that fastens the hose gland.

Unscrew and remove the two screws (6) fastening the rear brake caliper (7).

Free the rear brake caliper (7) from its support (3).

Unscrew and remove the pin (8) fastening the suspension (11).



Be sure to keep the nut (9) and washer (10).

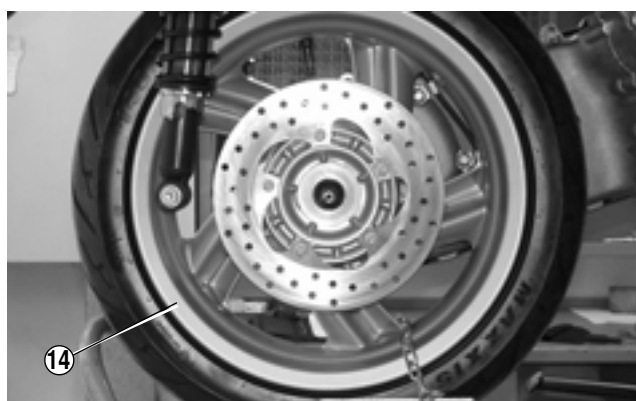
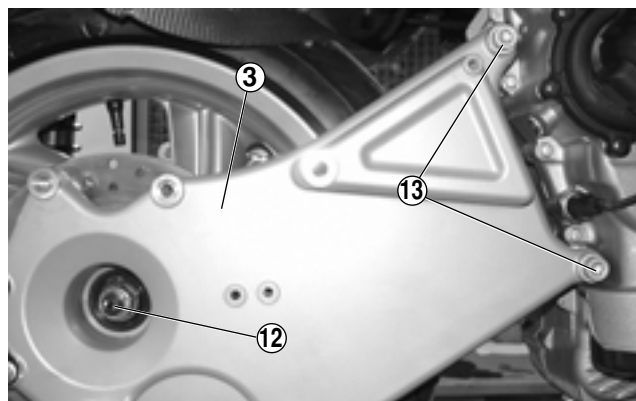
Free the right suspension (11) from its support (3).

Using a pneumatic gun, unscrew and remove the wheel pin nut (12).

Unscrew and remove the two screws (13) that fasten the support (3) to the engine, being sure to keep the relevant washers.

Remove the support (3) by sliding it outwards.

Remove the wheel (14) by sliding it outwards, together with the rear brake disc.





**REMOVING THE EXHAUST MUFFLER**

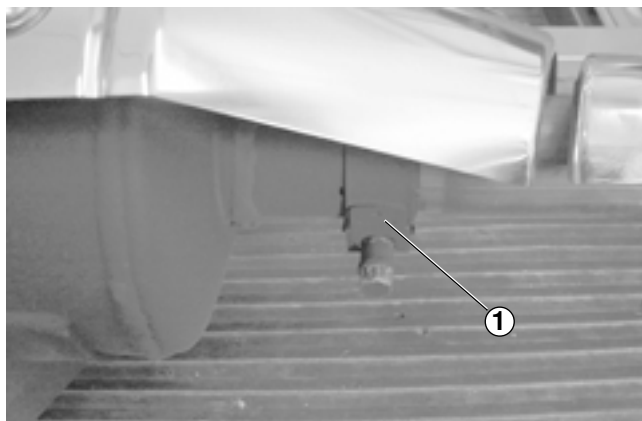
Read carefully (PRECAUTIONS AND GENERAL INFORMATION).

Place the motorcycle on the center stand.

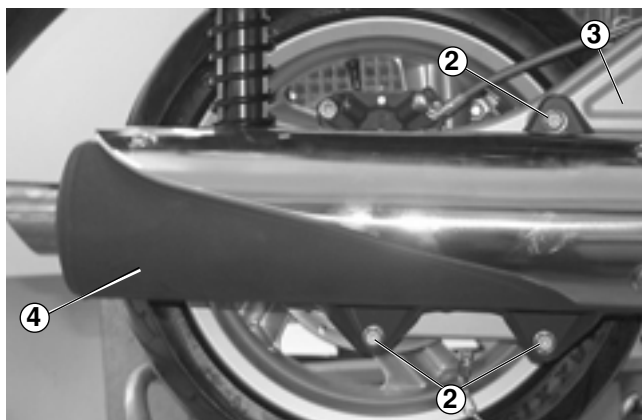
**⚠ WARNING**

**Wait until the engine and exhaust muffler cool down completely.**

Loosen the clamp (1) using the relevant lock nut that fastens the exhaust muffler to the manifold.



Unscrew and remove the three bolts (2) fastening the muffler to the support (3), being sure to keep the nuts. Remove the exhaust muffler (4).



## INSPECTION

## ⚠ CAUTION

Inspect the condition of all the components, especially the ones listed below.

## Bearings

Rotate the internal ring (1) manually: there must be no catching or noise.

There must be no end float.







Any bearings not meeting these requirements must be renewed.

## ⚠ CAUTION

Apply grease to the balls (or rollers) at the side of each bearing, see (LUBRICANT CHART).

This operation is not required if the bearing is of the self-lubricating type.

## Rear axle

See ENGINE WORKSHOP MANUAL n°1063 , n°1064 , n°1065 , n°1066 , n°1067  and n°1068 .

## Rim

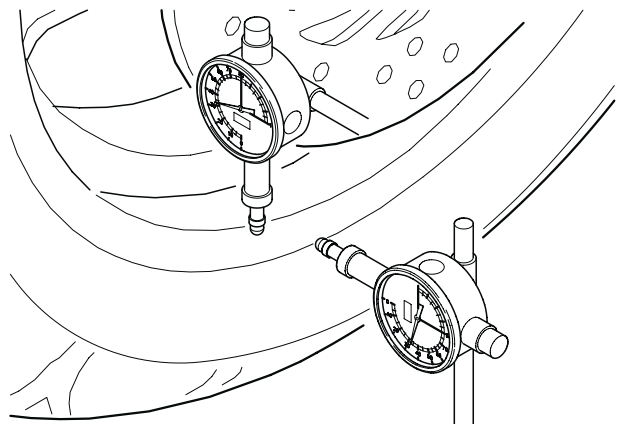
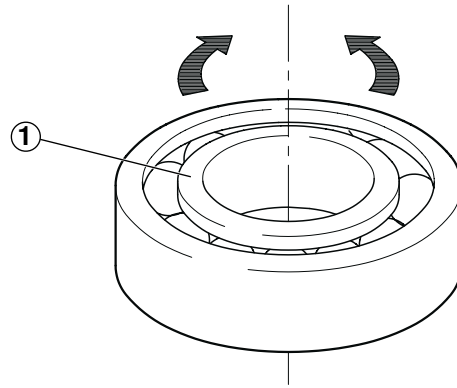
Using a dial indicator, determine that the radial and axial runout of the rim are within specification.

Excessive runout is usually caused by worn or damaged bearings or a bent axle. If after checking these components, you determine the rim still does not meet specification, the rim must be replaced.

**Max. radial and axial runout: 0.078 in (2 mm).**

## Tires

Check the condition of the tires, see (TIRES).



## FRONT BRAKE

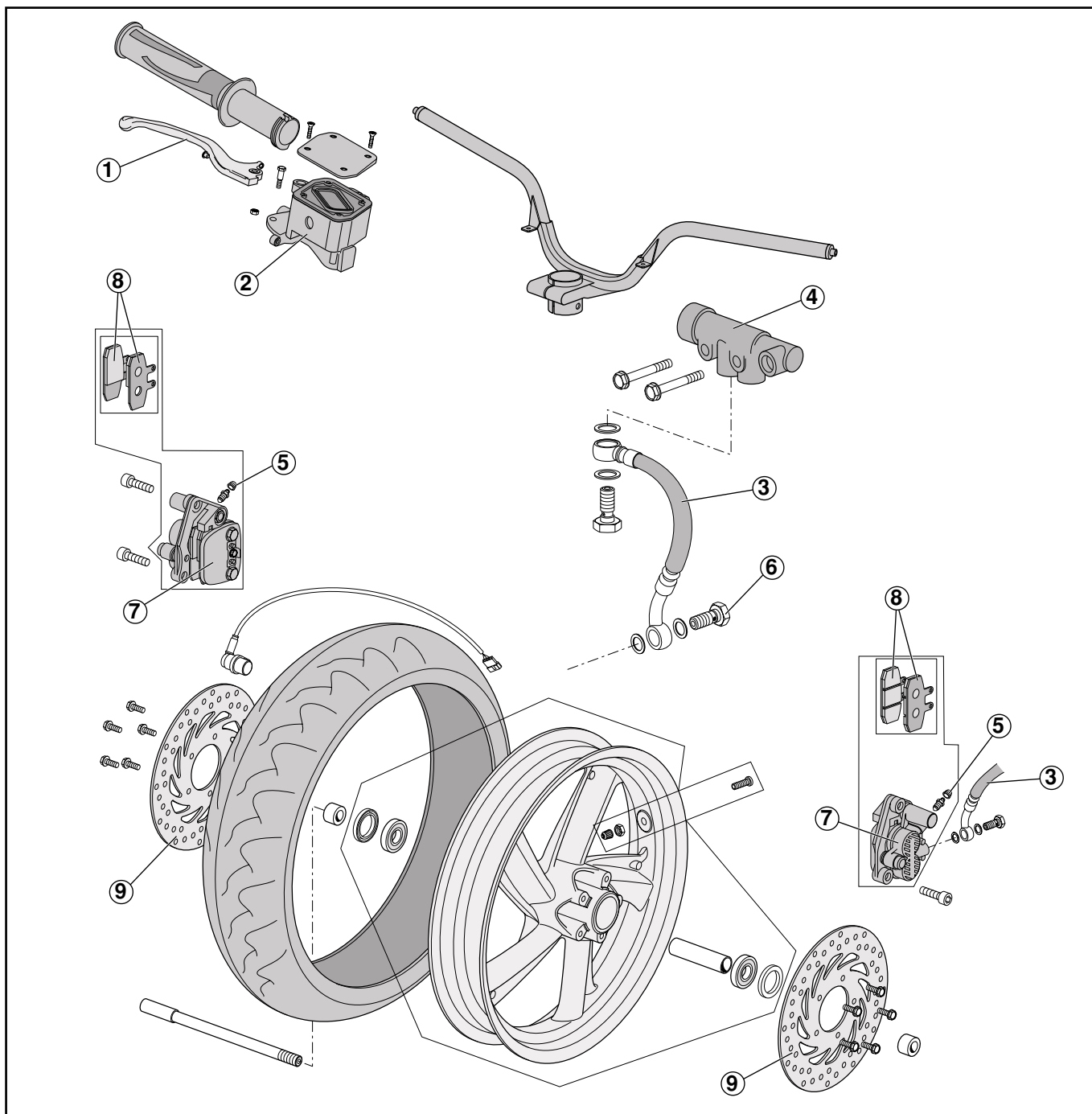
For general information, see (BRAKE FLUID).

For information about the following:

Brake system parts, see (BRAKING SYSTEM).

Brake pad wear checks, see (CHECKING THE WEAR OF THE BRAKE PADS).

Bleeding the brake system, see (BLEEDING THE BRAKING SYSTEM).



7

## KEY

- 1) Brake lever
- 2) Brake fluid pump/tank
- 3) Brake fluid tube
- 4) Braking delaying device
- 5) Brake caliper breather valve
- 6) Tube union screw
- 7) Brake calliper
- 8) Brake pads
- 9) Brake disc

## CHANGING THE BRAKE PADS

Read carefully (PRECAUTIONS AND GENERAL INFORMATION).

Place the motorcycle on the center stand.

**NOTE** Perform the following operations on both sides.

Unscrew and remove the screw (1).  
Unscrew and remove the two screws (2) and free the brake caliper (3).  
Still holding the brake caliper, remove the plate (4).  
Slide out the two pins (5).  
Remove the two pads.

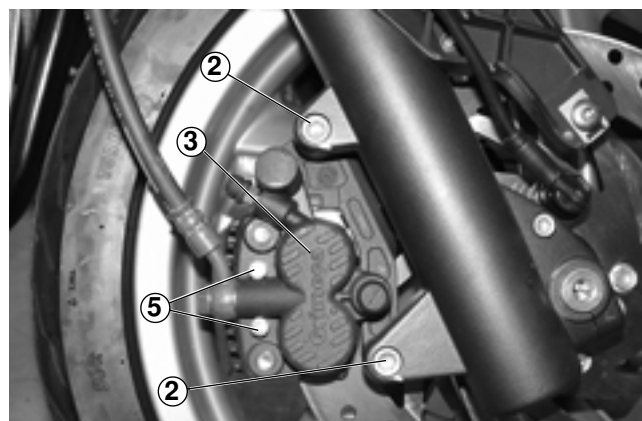
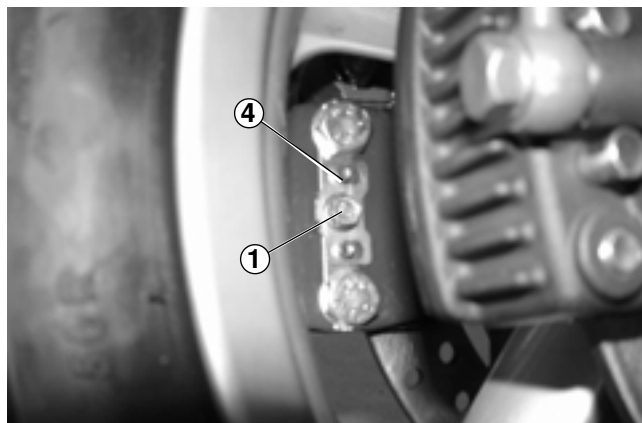
### ⚠ CAUTION

**Do not engage the front brake lever after removing the pads; this may cause the caliper piston to leave its seat, allowing brake fluid to leak.**

### ⚠ CAUTION

**Always replace both pads together in order to ensure they are correctly placed inside the caliper.**

Insert two new pads.  
Insert the two pins (5).  
Position the plate (4) correctly.  
Install the screw (1).  
Position the brake calipers correctly.  
Screw in and tighten the two screws (2).  
Screw in and tighten the screw (1).



## CHECKING THE BRAKE DISC

### ⚠ CAUTION

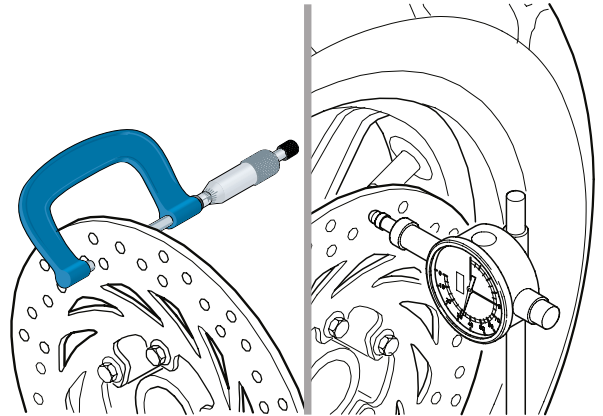
**This check must be done with the brake disc installed on the wheel.**

Make a visual check of the brake disc surface. If there are any lines or signs of wear, replace the disc, see (REMOVING THE BRAKE DISC). Check the brake disc for wear by measuring the minimum thickness in different points using a micrometer. If the minimum thickness is less than the limit value, even in a single point, replace the disc.

**Minimum brake disc thickness value: 0.137 in (3.5 mm)**

Use a dial indicator to check that disc oscillation does not exceed tolerance levels and if it does, replace the disc.

**Brake disc oscillation tolerance: 0.004 in (0.1 mm)**


**7**

## REMOVING THE BRAKE DISC

Read carefully (PRECAUTIONS AND GENERAL INFORMATION).

Remove the front wheel, see (REMOVING THE FRONT WHEEL).

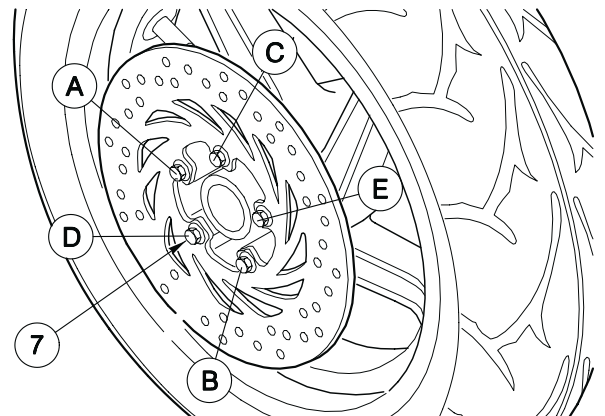
Unscrew and remove the five brake disc screws (7).

**NOTE** Screw in the screws manually and tighten them up in diagonal order, in the following sequence: A-B-C-D-E. Check the disc rotation direction.

### ⚠ CAUTION

**When refitting, apply LOCTITE® 270 to the brake disc screw threads.**

Remove the brake disc.



## REAR BRAKE

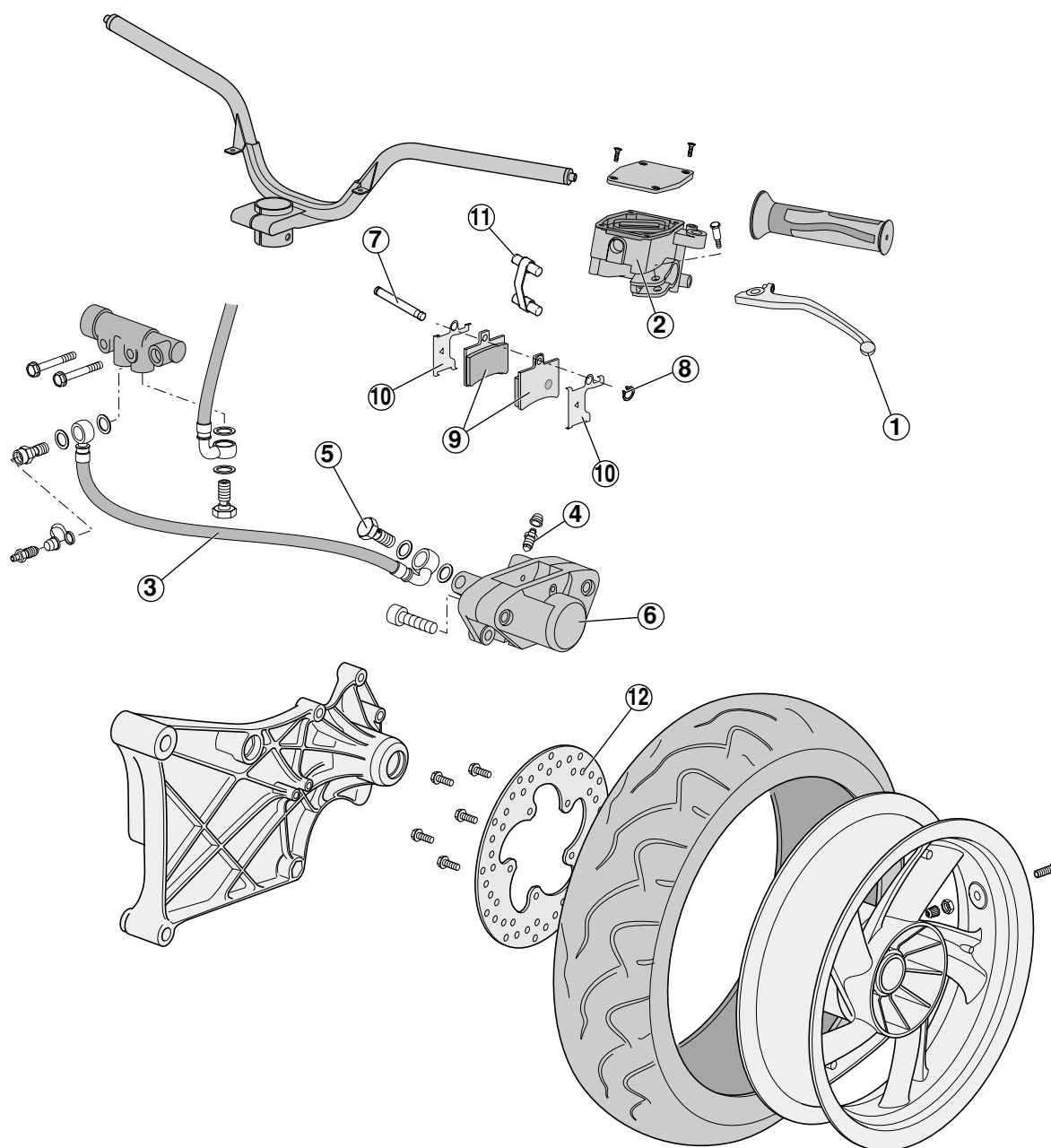
For general information, see (BRAKE FLUID).

For information about the following:

Brake system parts, see (BRAKING SYSTEM).

Brake pad wear checks, see (CHECKING THE WEAR OF THE BRAKE PADS).

Bleeding the brake system, see (BLEEDING THE BRAKING SYSTEM).



## KEY

- 1) Brake lever
- 2) Brake fluid pump/tank
- 3) Brake fluid tube
- 4) Valve
- 5) Tube union screw
- 6) Brake calliper
- 7) Pad pin
- 8) Collar
- 9) Brake pads
- 10) Anti-vibration springs
- 11) Pad springs
- 12) Brake disc

## CHANGING THE BRAKE PADS

Read carefully (PRECAUTIONS AND GENERAL INFORMATION).

Remove the rear brake caliper, see (REMOVING THE REAR BRAKE CALIPER).

Remove the collar (1).

Slide out the pin (2).

Remove the spring (3).

### ⚠ CAUTION

**As the pads slide out, the vibration-damping plates will slide out with them.**

Remove the pads (4) (complete with vibration-damping plates (5)), sliding them out one at a time.

### ⚠ CAUTION

**Do not engage the brake lever after removing the pads; this may cause the caliper piston to leave its seat, allowing brake fluid to leak.**

Replace the pads (4).

Replace the vibration-damping plates (5) if they are worn.

### ⚠ CAUTION

**Always replace both pads together in order to ensure they are correctly placed inside the caliper.**

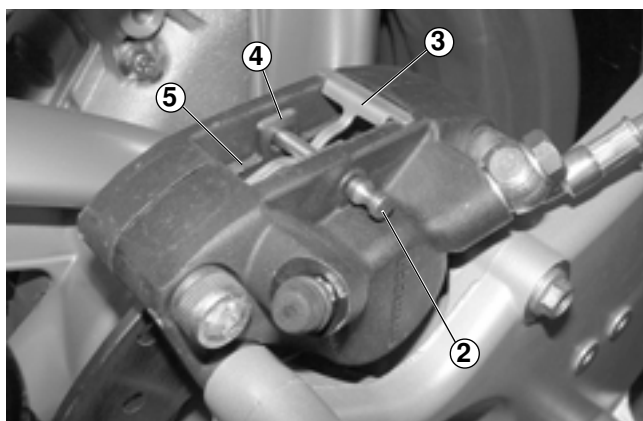
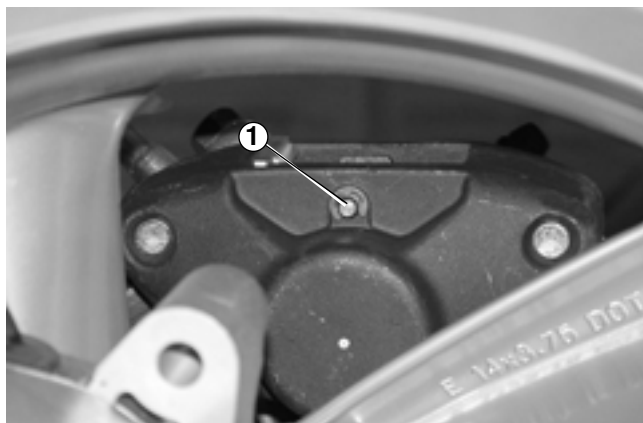
Insert two new pads, together with the vibration-damping plates, taking care to respect the fitting direction (arrow in the rotation direction of the wheel).

Insert the spring (3) correctly, see direction arrow.

Insert the pin (2).

Fit the collar (1).

Check the level of the brake fluid, see (CHECKING THE BRAKE FLUID LEVEL).





## CHECKING THE BRAKE DISC

### ▲ CAUTION

**This check must be done with the brake disc installed on the wheel.**

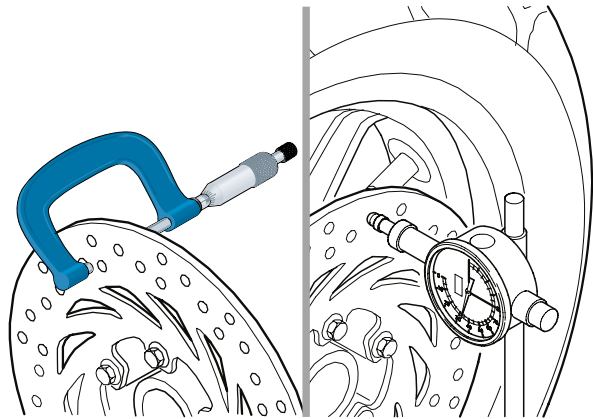
Make a visual check of the brake disc surface. If there are any lines or signs of wear, replace the disc, see (REMOVING THE BRAKE DISC).

Check the brake disc for wear by measuring the minimum thickness in different points using a micrometer. If the minimum thickness is less than the limit value, even in a single point, replace the disc.

**Minimum brake disc thickness value: 0.137 in (3.5 mm)**

Use a dial indicator to check that disc oscillation does not exceed tolerance levels and if it does, replace the disc.

**Brake disc oscillation tolerance: 0.004 in (0.1 mm)**



## REMOVING THE BRAKE DISC

Read carefully (PRECAUTIONS AND GENERAL INFORMATION).

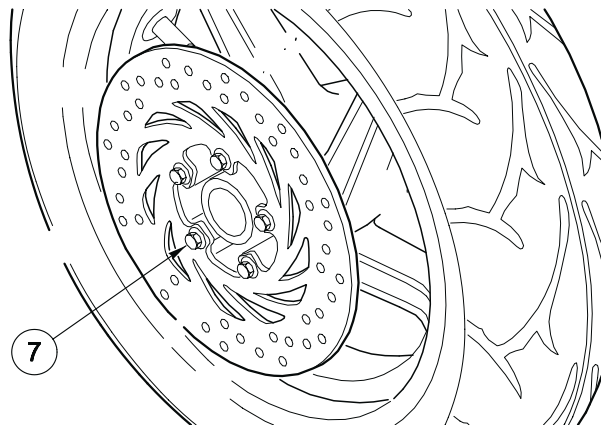
Remove the rear wheel, see (REMOVING THE REAR WHEEL).

Unscrew and remove the five brake disc screws (7).

### ▲ CAUTION

**When refitting, apply LOCTITE® 270 to the brake disc screw threads.**

Remove the brake disc.



## STEERING

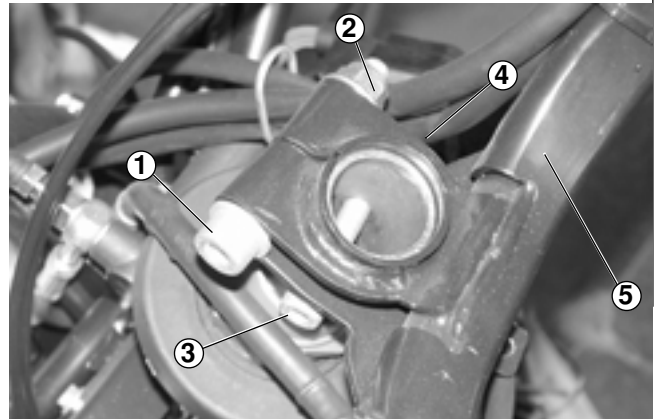
For information on checking and adjusting the steering, see (CHECKING AND ADJUSTING THE STEERING).

### Removal

Read carefully (PRECAUTIONS AND GENERAL INFORMATION).

Remove the handlebar cover, see (REMOVING THE TOP HANDLEBAR COVER) and (REMOVING THE BOTTOM HANDLEBAR COVER).

Position the motorcycle on its center stand, on a lift platform, so that the front wheel can overhang the front of the platform.



### ⚠ CAUTION

**Place a suitable support below the vehicle in order to prevent it from falling.**

**The vehicle must rest on the frame and never on the fuel tank for any reason.**

**Ensure that the vehicle is stable.**

Unscrew and remove the screw (1).

Be sure to keep the nut (2) and relevant washers.

Unscrew and remove the screw (3).

Be sure to keep the nut (4) and relevant washers.

Remove the front mudguard (REMOVING THE FRONT MUDGUARD).

### ⚠ CAUTION

**Prepare a suitable support for the handlebars, which remain connected to the vehicle by the electrical cables and the brake pipes.**

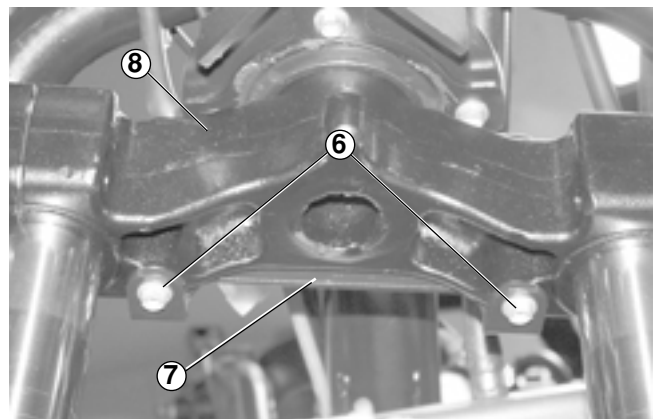
**Work with caution.**

**Don not force electric cables.**

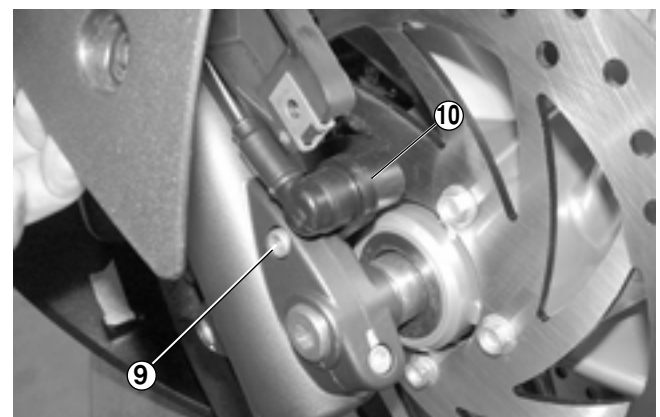
Slide the handlebar (5) (complete with switches) upwards fully.

Unscrew and remove the two screws (6).

Free the plate (7) from the trapeze bar (8) of the steering suspension.



Unscrew and remove the screw (9) and free the km counter sensor (10).

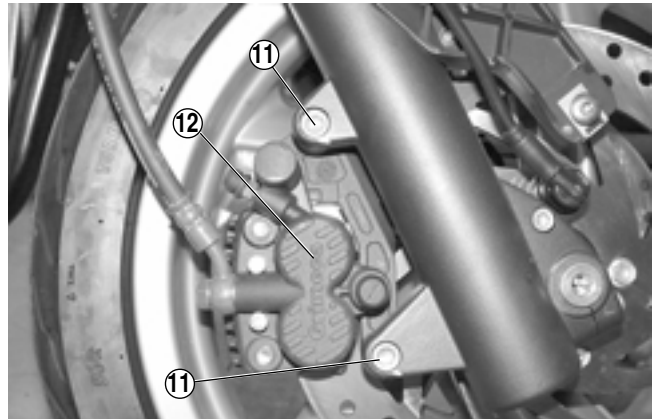


**NOTE** Perform the following operation from the left side of the vehicle also.

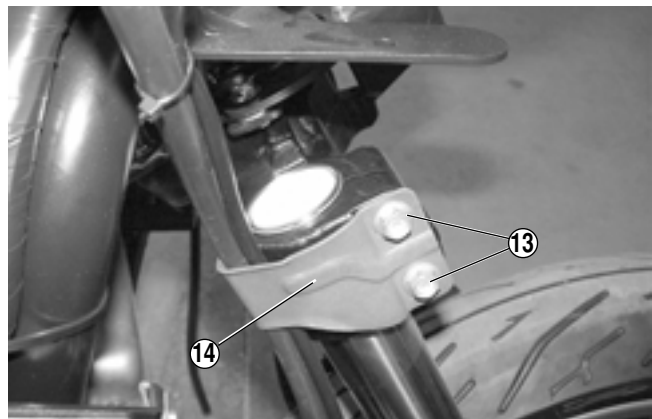
Unscrew and remove the two screws (11).  
Free the brake caliper (12) from the fork.

**⚠ CAUTION**

**Do not engage the front brake lever after removing the brake caliper; this may cause the caliper piston to leave its seat, allowing brake fluid to leak.**



Unscrew and remove the two screws (13).  
Remove the brake oil pipe clamp plate (14).  
Free the piping and brake caliper from the fork.



Unscrew and remove the locknut (15).

**⚠ CAUTION**

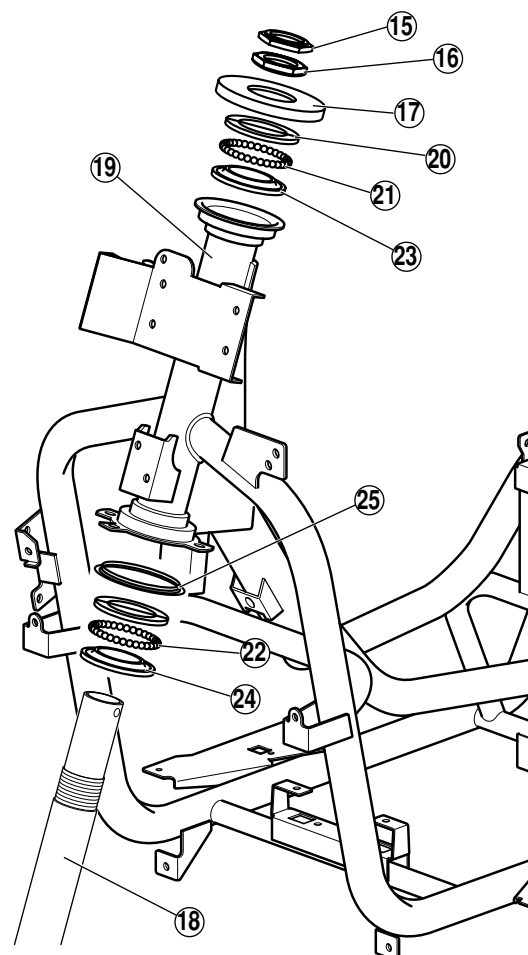
**Hold on to the fork to stop the motorcycle falling over accidentally.**

**NOTE** Take care that the inner ball bearings do not come out when sliding off the fork.

Unscrew and remove the register nut (16).  
Slide off the plastic gasket (17).  
Slide off the fork (18) from the steering shell (19).  
Remove the rotating seat (20) and balls (21) from the top bearing.  
Remove the balls from the bottom bearing (22).  
Clean the grease from all bearing parts, including the fixed seats (23) and (24).  
Remove the dust guard gasket (25).  
Check the parts for wear and replace if necessary.

**NOTE** For the bearing grease type, see (LUBRICANT CHART).

Grease and refit.



## INSPECTION OF THE BEARINGS

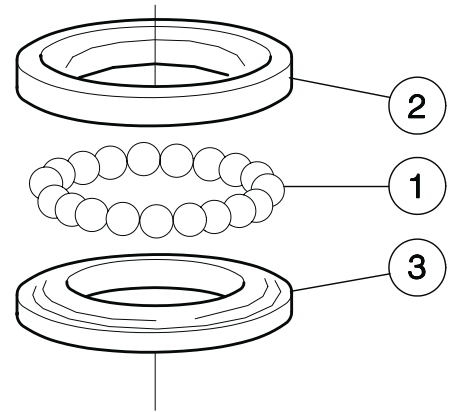
**⚠ CAUTION**

**Check that the parts are in proper working order.**

Make sure that the area coming into contact with the balls (1) (on the rotating (2) and fixed (3) seats) is not damaged or excessively worn. If any damage or wear is found, replace the whole bearing.

**⚠ CAUTION**

**Apply grease to the area coming into contact with the bearings in the two seats (2 and 3), see (LUBRICANT CHART).**



## Refitting

To refit, follow the disassembly instructions in reverse order, including the following steps:

**⚠ CAUTION**

**Make sure that no pipes or cables are twisted.**

**NOTE** The hole for fastening to the handlebar clamp must be aligned with the cable on the fork pin.

**⚠ CAUTION**

**Do not forcefully screw or tighten the register nut (4) in order not to damage the steering bearings.**

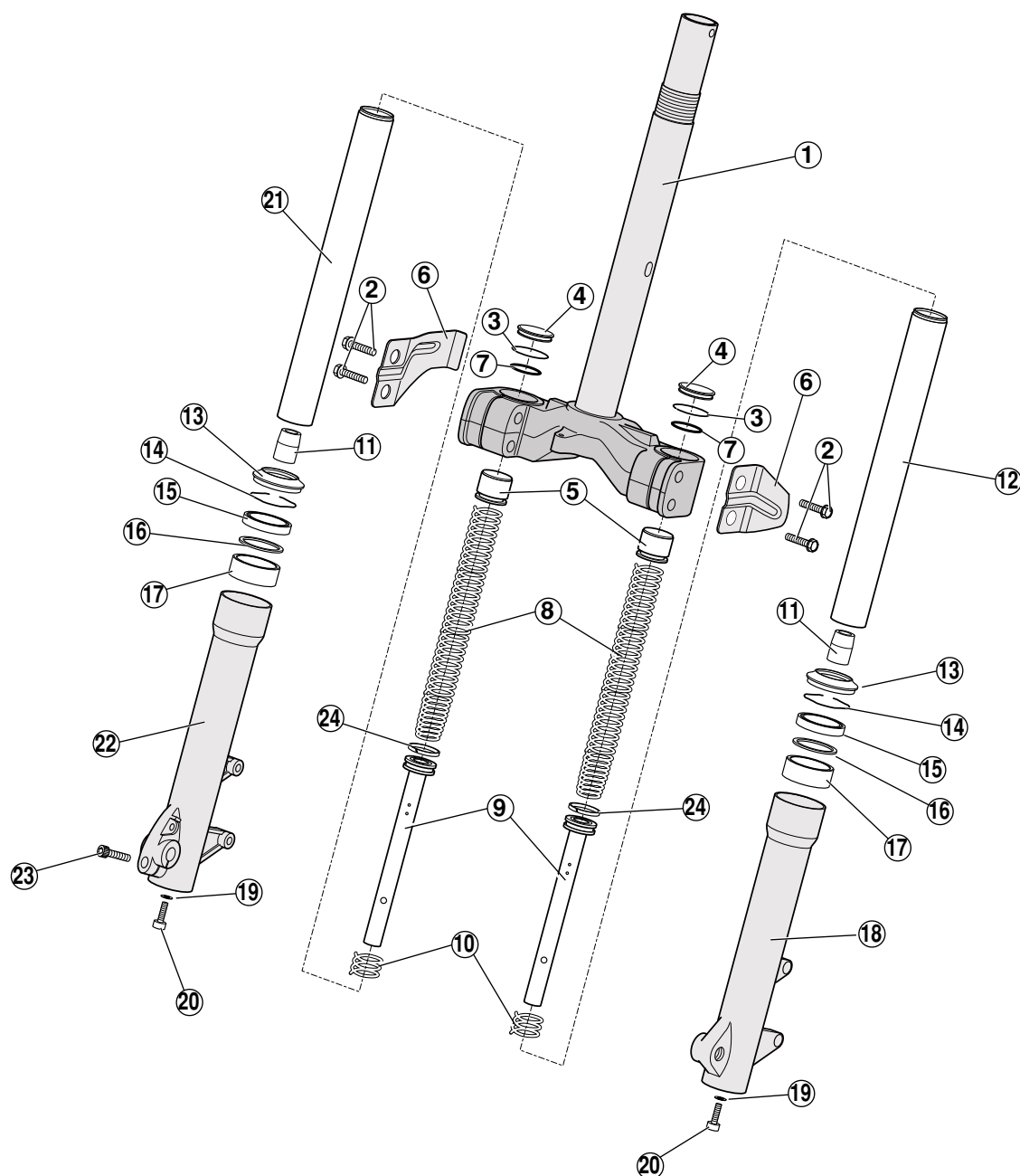
Tighten the register nut (4) until bearing play is restored.

Check the play by moving the fork in the direction of travel and making sure that steering movements are fluid and freely rotating.

Lock the register nut (4) into position and tighten the lock nut (5) with a wrench.

Repeat the second operation.





## KEY

- |                      |                         |
|----------------------|-------------------------|
| 1) Fork base         | 13) Dust guard gasket   |
| 2) Fork clamp screws | 14) Retaining ring      |
| 3) Snap ring         | 15) Gasket seal         |
| 4) Rubber cap        | 16) Retainer cap        |
| 5) Seal plug         | 17) Bushing             |
| 6) Brake pipe gland  | 18) Left wheel support  |
| 7) "GACO" O-ring     | 19) Washer              |
| 8) Spring            | 20) Bottom screw        |
| 9) Pumping element   | 21) Right rod           |
| 10) Return spring    | 22) Right wheel support |
| 11) Bottom pad       | 23) Lock screw          |
| 12) Left rod         | 24) Bushing             |

## CHECKING THE OIL LEVEL

If fork "end of travel" is found, the level of the rod oil must be checked.

Remove the front shield, see (REMOVING THE FRONT SHIELD).

**NOTE** To facilitate removal of the two seal plugs (3), they must both be removed at the same time.

Remove the snap ring (1).

Remove the plastic cap (2).

Gently pump the fork until the two seal plugs (3) and O-rings (4) come out.

**NOTE** Ensure that the O-rings are in proper working order and if not, replace.

**NOTE** Check the position of the spring (5) (coils with smaller diameter closer together at the top).

### ⚠ CAUTION

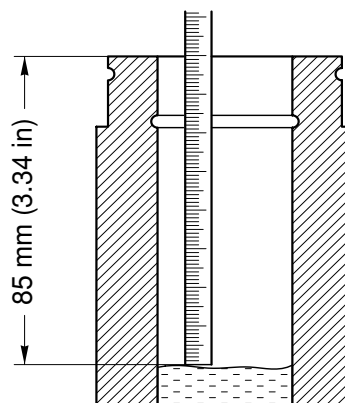
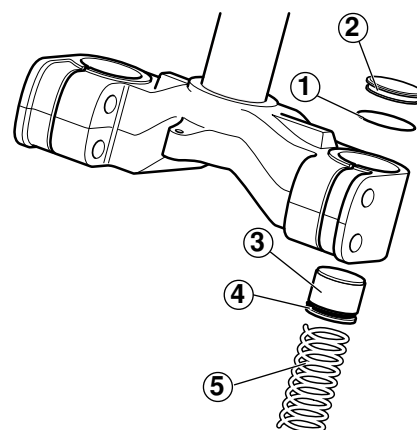
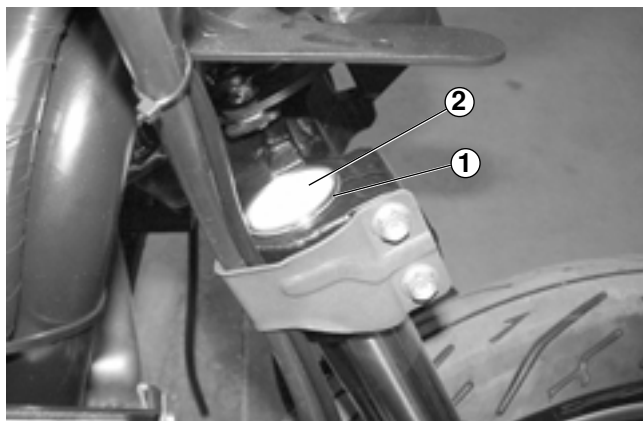
**The spring is immersed in oil.  
Avoid drips when removing.**

Slide out the spring (5).

Bring the fork to the end of its travel, insert a calibrated rod (measuring rule) into one of the two rods, and make sure that there are 3.34 in (85 mm) of air between the top rim of the rod and the oil level.

If necessary, top up the fork oil, see (LUBRICANT CHART).

Repeat this operation for the second rod.



7

## REMOVING THE WHOLE FORK

To remove the whole fork (for replacement) follow the instructions, see (DISASSEMBLING).



**REMOVING THE ROD-WHEEL SUPPORT ASSEMBLY (with fork fitted)**

Place the motorcycle on the center stand.

**▲ CAUTION**

**Place a suitable support under the vehicle in order to prevent it from falling.**

Remove the front mudguard, see (REMOVING THE FRONT MUDGUARD).

Remove the front wheel, see (REMOVING THE FRONT WHEEL).

Remove the front shield, see (REMOVING THE INNER SHIELD).

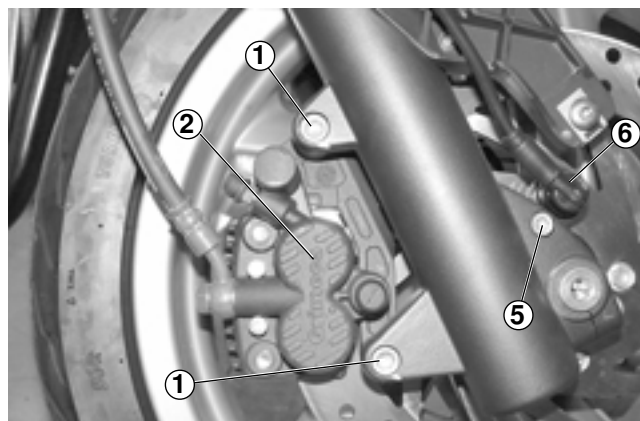
**NOTE** Perform the following operation from the left side of the vehicle also.

Unscrew and remove the two screws (1)

Free the brake caliper (2) from the fork.

**▲ CAUTION**

**Do not engage the front brake lever after removing the brake caliper; this may cause the caliper piston to leave its seat, allowing brake fluid to leak.**



Unscrew and remove the two screws (3).

Remove the brake oil pipe retaining plate (4) and retainer (6).

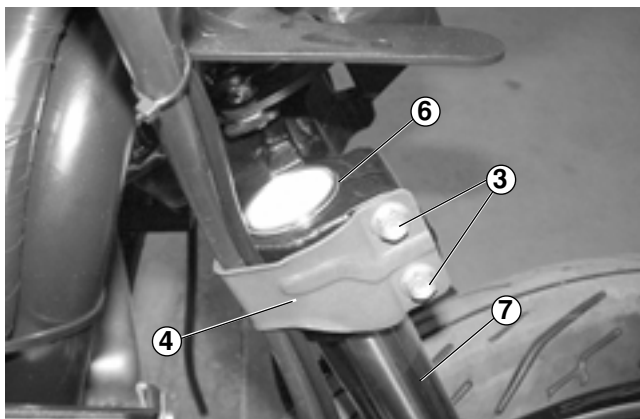
Free the piping and brake caliper from the fork.

Unscrew and remove the screw (5).

Remove the km counter sensor (6) from the fork rod (7).

Lower the fork rod complete with wheel support, and slide it out completely.

Repeat the last three steps for the second rod.





## DISASSEMBLING THE ROD-WHEEL SUPPORT

Read carefully (PRECAUTIONS AND GENERAL INFORMATION).

To disassemble the small parts: rubber cap (1), retaining ring (seeger) (2), seal plug (3) complete with O-ring (4) and spring (5), carry out the operations for (CHECKING THE OIL LEVEL) on the relevant wheel rod, omitting the last two steps (checking the oil level).

**▲ CAUTION**

**Danger of oil spillage.**

**The rod-wheel support assembly is full of oil.**

**Do not overturn it or incline it too far when removing.**

Remove the rod-wheel support assembly, see (REMOVING THE ROD-WHEEL SUPPORT ASSEMBLY (with fork fitted)).

Prepare a measuring container with a capacity of no less than 12.2 cu. in (200 cm<sup>3</sup>).

Retract the rod fully into the wheel support, rotate the rod – wheel support assembly and bleed the oil into the container.

**▲ CAUTION**

**Check the oil quantity.**

**If less than 13.72 cu. in (225 cm<sup>3</sup>) top up or replace.**

Unscrew and remove the screw (6) (bottom of wheel support) and be sure to keep the copper washer (7). Slide out the rod (8) complete with pumping element (9).

Turn the wheel support (10) to retrieve the bottom pad (11) and the return spring (12).

Remove the dust guard gasket (13).

Remove the retaining ring (seeger) (14).

**▲ CAUTION**

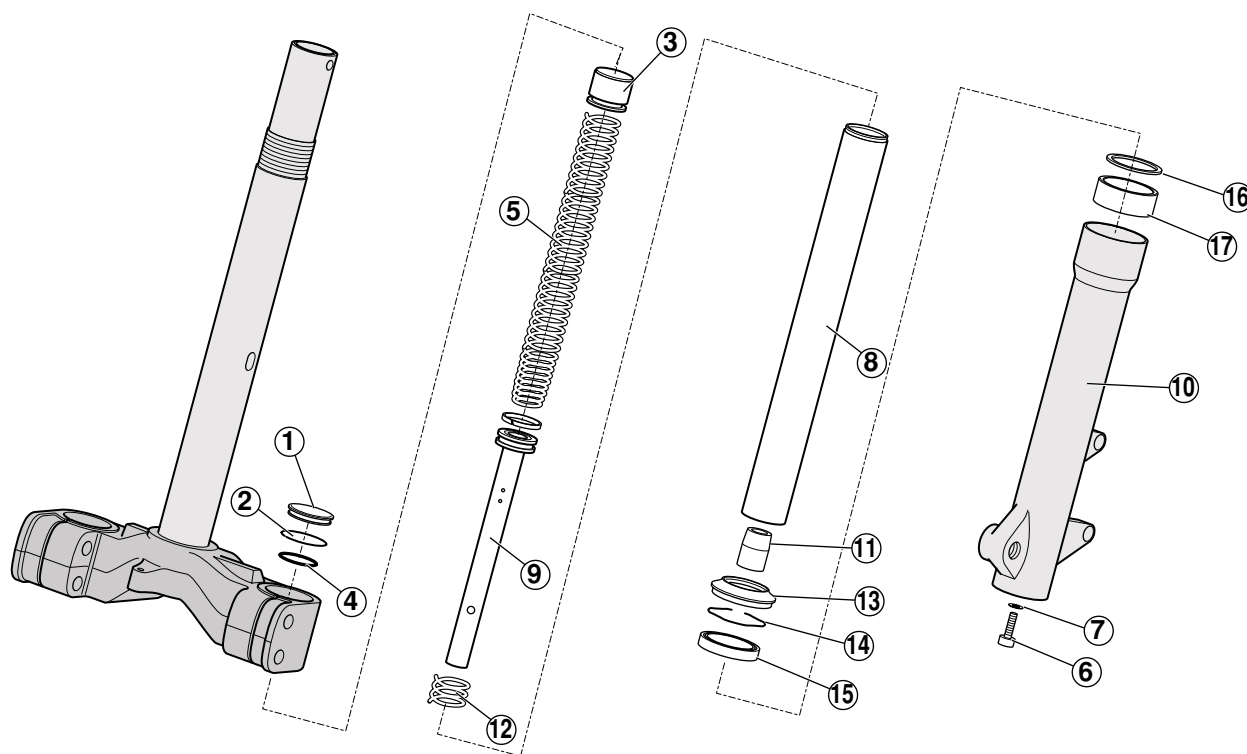
**Upon reassembly, position the retaining ring (seeger) (14) with the sharp edge facing the contact point (see figure).**

Remove the gasket seal (15).

Remove the retainer cap (16).

Remove the bushing (17).

7



## CHECKING THE PARTS

### Rod

The sliding surface must not be lined and/or scratched.  
If the lines are deep, replace the rod.

Use a dial gauge to check that any curving in the rod is less than the limit value.

If above the limit value, replace the rod.

**Curve limit: 0.007 in (0.2 mm).**

### ⚠ WARNING

**NEVER straighten a curved rod; this will weaken the structure of the vehicle, making it dangerous to use.**

### Wheel support

Make sure there is no damage and/or cracking and replace if necessary.

### Spring

Make sure that the spring is in perfect working order.

### Pumping element

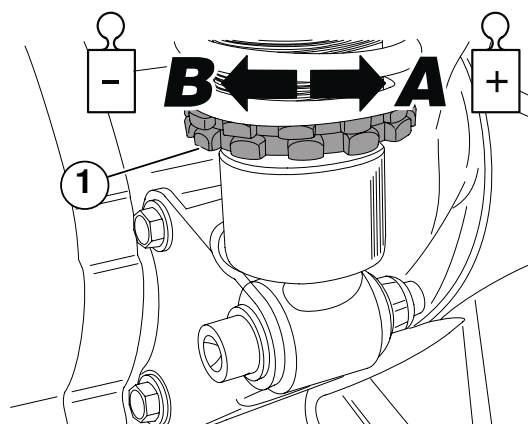
Make sure it is in perfect working order and replace if there are any signs of damage.

## ADJUSTING THE REAR SUSPENSION

The rear suspension is comprised of a pair of dual-effect shock absorbers (braking in compression/extension), fixed to the engine by means of a silent block.

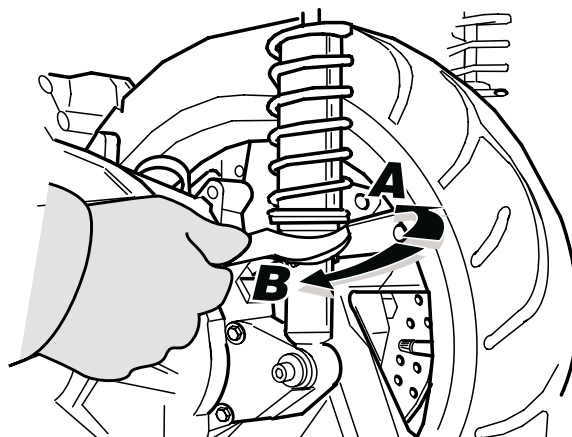
The standard factory setting is for a rider weighing approximately 154.3 lbs (70 kg). For different weights and requirements, use the pin wrench (supplied) on the ring nut (1) to define ideal use conditions (see chart).

**Calibrate both shock absorbers to the same position.**



**REAR SUSPENSION SPRING PRELOADING  
SETTING TABLE**

Adjusting ring nut	Rotation (arrow A)	Rotation (arrow B)
Function	Spring preload increase	Spring preload decrease
Attitude	The vehicle is more rigid	The vehicle is less rigid
Recommended kind of road	Smooth or normal roads	Roads with uneven surface
Notes	Rider and passenger	Solo rider

**REMOVING THE REAR SUSPENSION**

Read carefully (PRECAUTIONS AND GENERAL INFORMATION).

Place the motorcycle on the center stand.

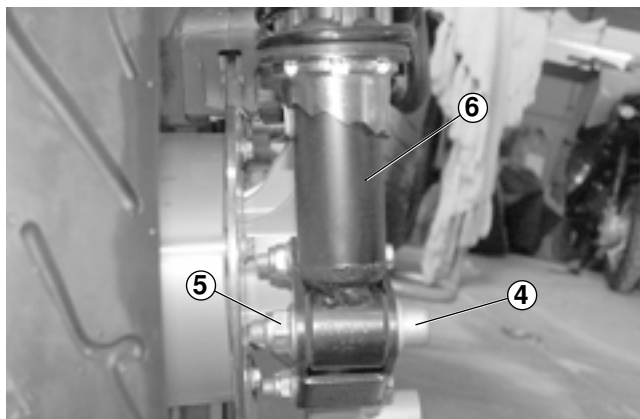
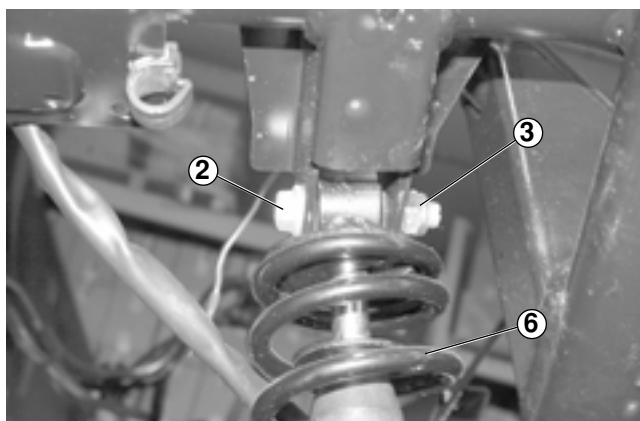
**⚠ WARNING**

Wait until the engine and exhaust muffler have cooled completely.

**⚠ CAUTION**

Remove one shock absorber at a time.  
To keep the vehicle in position, always leave one shock absorber fitted.

**NOTE** Perform the following operations on both shock absorbers.  
Unscrew and remove the bottom screws (4) and be sure to keep the nut (5).  
Unscrew and remove the screw (2) and be sure to keep the nut (3).  
Remove the shock absorber (6).

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